# QUITCHUPAH CREEK ROAD

## Final Environmental Impact Statement
## January 2006

U.S. Department of Agriculture
Forest Service
Fishlake National Forest

U.S. Department of Interior
Bureau of Land Management
Richfield Field Office

This is an FEIS conducted through the NEPA process on the Fishlake National Forest and on Richfield BLM Public Lands.

# QUITCHUPAH CREEK ROAD PROJECT
# FINAL
# ENVIRONMENTAL IMPACT STATEMENT

| | | |
|---|---|---|
| **Responsible Agencies:** | **U.S.D.A. Forest Service (Lead Agency)**<br>Fishlake National Forest<br>**U.S.D.I. Bureau of Land Management**<br>Richfield Field Office | |
| **Responsible Officials:** | Mary C. Erickson<br>Forest Supervisor<br>Fishlake National Forest<br>115 East 900 North<br>Richfield, Utah 84701 | Cornell Christensen<br>Field Manager<br>Bureau of Land Management<br>Richfield Field Office<br>150 East 900 North<br>Richfield, Utah 84701 |
| **For Further Information Contact:** | Rod Lee<br>Resource Advisor<br>Bureau of Land Management<br>Richfield Field Office<br>(435) 896-1500<br>Rod_Lee@blm.gov | |
| **State:** | Utah | |
| **Counties:** | Sevier, Emery | |


**ABSTRACT:**

This Final Environmental Impact Statement (FEIS) is written in response to a right-of-way application submitted by the Sevier County Special Service District (SSD) to the USFS and the BLM for the construction of the Quitchupah Creek Road, a public road to be utilized primarily as a coal transport route for the SUFCO Mine. The Quitchupah Creek Road FEIS analyzes one Federal action that requires decisions by the responsible officials of the USDA-FS and the USDI-BLM. The Federal action is to consider granting the right-of-way. Four alternatives were considered in this analysis: 1) No Action (Alternative A), 2) Quitchupah Creek Road (Alternative B), 3) Alternate Junction and Alternate Design (Alternative C), and 4) Water Hollow (Alternative D). The responsible officials for the BLM and FS have identified Alternative D as the Preferred Alternative.


**January 2006**

# QUITCHUPAH CREEK ROAD PROJECT FEIS

# TABLE OF CONTENTS

# LIST OF FIGURES

***(Figures for each Chapter are grouped at the end of the Chapter)***

# LIST OF TABLES

## LIST OF APPENDICES

# LIST OF ACRONYMS & ABBREVIATIONS

| | |
|---|---|
| **AADT** | Average Annual Daily Traffic |
| **ACEC** | Area of Critical Environmental Concern |
| **ACHP** | Advisory Council on Historic Preservation |
| **ADT** | Average Daily Traffic |
| **AASHTO** | American Association of State Highway and Transportation Officials |
| **AERC** | Archaeological Environmental Research Corporation |
| **AIRS** | Aerometric Information Resource System |
| **AMSL** | Above Mean Sea Level |
| **ATV** | All-Terrain Vehicle |
| **AUM** | Animal Unit Month |
| **BA** | Biological Assessment |
| **BE** | Biological Evaluation |
| **BCI** | Biotic Condition Index |
| **BLM** | Bureau of Land Management |
| **BMP** | Best Management Practices |
| **BYU** | Brigham Young University |
| **CBR** | California Bearing Ratio |
| **CEQ** | Council of Environmental Quality |
| **CFR** | Code of Federal Regulations |
| **cfs** | Cubic Feet Per Second |
| **CO** | Carbon Monoxide |
| **COE** | U. S. Army Corps of Engineers |
| **$CTQ_a$** | Actual Community Tolerance Quotient |
| **$CTQ_p$** | Predicted Community Tolerance Quotient |
| **dB** | Decibel |
| **dBA** | Decibel-A weighted |
| **DWQ** | Division of Water Quality |
| **EA** | Environmental Assessment |
| **EIS** | Environmental Impact Statement |
| **EO** | Executive Order |
| **EPA** | Environmental Protection Agency |
| **ESA** | Endangered Species Act |
| **FHWA** | Federal Highway Administration |
| **FPU** | Forest Planning Unit |
| **gpm** | Gallons Per Minute |
| **$g/m^2$** | Grams per Square Meter |
| **IDT** | Interdisciplinary Team |
| **I-70** | Interstate 70 |
| **JBR** | JBR Environmental Consultants, Inc. |
| **JW** | Jurisdictional Wetland |
| **K** | Erodibility Factor |
| **KOP** | Key Observation Point |
| **$L_{pt}$** | Sound Pressure Level |
| **$L_{pat}$** | Sound Level |
| **$L_{50}$** | Noise Levels as a Function of Exceeding 50 dBA 50 Percent of the Time |

| | |
|---|---|
| **$L_{eq}$** | Equivalent Sound Level |
| **LRMP** | Land and Resource Management Plan |
| **mm** | Millimeters |
| **mmtpy** | Million Tons per Year |
| **MFP** | Management Framework Plan |
| **mg/l** | milligram per liter |
| **MIS** | Management Indicator Species |
| **MOAC** | Montgomery Archaeological Consultants, Inc. |
| **MSE** | Mechanically Stabilized Earth |
| **MSHA** | Mining Safety and Health Administration |
| **NAAQS** | National Ambient Air Quality Standards |
| **NEPA** | National Environmental Policy Act |
| **NHPA** | National Historic Preservation Act |
| **NOI** | Notice of Intent |
| **$NO_x$** | Oxides of Nitrogen |
| **NRCS** | Natural Resources Conservation Service |
| **NRHP** | National Register of Historic Places |
| **OHWM** | Ordinary High Water Mark |
| **OSHA** | Occupational Safety and Health Administration |
| **PEL** | Permissible Exposure Level |
| **PLS** | Pure Live Seed |
| **PM** | Particulate Matter |
| **$PM_{10}$** | Particulate Matter Less Than 10 Microns |
| **PNC** | Perennial Native Community |
| **PSD** | Prevention of Significant Deterioration |
| **RARE** | Roadless Area Review and Evaluation |
| **RCMP** | Round Corrugated Metal Pipe |
| **RDCC** | Resource Development Coordinating Committee |
| **RMP** | Resource Management Plan |
| **RNA** | Research Natural Area |
| **ROD** | Record of Decision |
| **ROS** | Recreational Opportunity Spectrum |
| **SCT** | Savage Coal Terminal |
| **SEUOHV** | Southeastern Utah Off-Highway Vehicle Club |
| **SHPO** | State Historic Preservation Office |
| **SITLA** | State School and Institutional Trust Lands Administration |
| **SLBM** | Salt Lake Base Meridian |
| **$SO_2$** | Sulfur Dioxide |
| **SR-10** | State Route 10 |
| **SSD** | Special Service District |
| **SUFCO** | Southern Utah Fuel Company |
| **SWPPP** | Storm Water Pollution Prevention Plan |
| **TCP** | Traditional Cultural Property |
| **TDS** | Total Dissolved Solids |
| **TES** | Threatened, Endangered, and Sensitive |
| **TMDL** | Total Maximum Daily Load |
| **tpy** | Tons Per Year |
| **UDOT** | Utah Department of Transportation |

| | |
|---|---|
| **UDWR** | Utah Division of Wildlife Resources |
| ***ug*/M$^3$** | micrograms of particles per cubic meter of air |
| **UGS** | Utah Geological Survey |
| **UOSH** | Utah Occupational Safety and Health Division |
| **UPDES** | Utah Pollutant Discharge Elimination System |
| **UP&L** | Utah Power and Light Company |
| **USFS** | United States Forest Service |
| **USFWS** | United States Fish and Wildlife Service |
| **US GSA** | United States General Services Administration |
| **USLE** | Universal Soil Loss Equation |
| **UWC** | Utah Wilderness Coalition |
| **VdB** | Velocity Decibel |
| **VOC** | Volatile Organic Compounds |
| **VQO** | Visual Quality Objective |
| **VRM** | Visual Resource Management |
| **WEG** | Wind Erodibility Group |
| **WIU** | Wilderness Inventory Units |
| **WSA** | Wilderness Study Area |
| **yd$^3$** | Cubic Yards |

# Executive Summary

# EXECUTIVE SUMMARY

## INTRODUCTION

This Environmental Impact Statement (EIS) considers a single proposed Federal action, with alternatives, and is a joint document between the United States Forest Service (USFS), Fishlake National Forest (Lead Agency) and the Bureau of Land Management (BLM), Richfield Field Office (Cooperating Agency). This National Environmental Policy Act (NEPA) analysis considers the potential environmental consequences associated with implementing the Proposed Action and Alternatives, as described below.

The Sevier County Special Service District Number 1 (SSD) has submitted right-of-way applications to the USFS and the BLM for the construction of the Quitchupah Creek Road, a public road. The Quitchupah Creek Road would be generally located between the Acord Lakes Road (Sevier County Road #010) and the junction with State Route 10 (SR-10). Lands along the route are administered by the USFS – Fishlake National Forest, the BLM – Richfield Field Office, Utah State School and Institutional Trust Lands Administration (SITLA) – Central Area, all based in Richfield, and private interests.

This EIS addresses the need for Federal decisions approving right-of-way applications, or an alternative, which would cross Federal lands. The Forest Supervisor for the Fishlake National Forest and the Richfield Field Office Manager for the BLM are responsible officials for the EIS. They will make their respective decisions regarding the Proposed Actions after considering the comments, responses, and environmental consequences discussed in the EIS. The rationale for each agency decision will be documented in separate Records of Decision (RODs).

## PURPOSE AND NEED

The purpose of the Federal action is to respond to a request from Sevier County SSD for granting a right-of-way to construct a public road. Southern Utah Fuel Company Mine (SUFCO Mine) would then be a toll user of this public road. Due to the SUFCO Mine location in rugged terrain, and the distance to railheads and loadouts, SUFCO Mine relies on truck transport for all of its coal shipments. The need for the road project is to ensure the competitive productivity of the SUFCO Mine, as a source of economic stability for Sevier County, a potential source of additional income and revenue for Emery County, and a source of high quality coal for electrical power generating plants in eastern Utah and the Midwest.

The recently signed National Energy Policy Act 2005 seeks to provide reliable, affordable energy to our nation's consumers, and to lessen the impact on Americans of energy price volatility and supply uncertainty. The demand for electricity in the U.S. is projected to increase by 45% over the next 20 years (National Energy Policy website). Access to coal reserves via any of the road alternatives proposed in this document would reduce fuel consumption by shortening the transport routes, and would help to maintain supplies of diverse and traditional forms of energy within the U.S. (domestic oil, gas and coal). The National Energy Policy promotes such improvements in the productive and efficient use of energy.

## SUMMARY OF PROPOSED ROAD

Sevier County SSD has proposed the upgrade and realignment of an existing 9.15 mile road, along Quitchupah Creek, which connects the Acord Lakes Road (Sevier County Road #010) in Convulsion Canyon, Sevier County with SR-10 in Emery County. The land ownership in this corridor is a combination of private, USFS, BLM, and SITLA.

The proposed road (Alternative B) would be 8.9 miles long, with a 28-foot wide paved surface, and an operational right-of-way of 66 feet. Six pullouts for parking off the road shoulder would be provided at various locations (See **Appendix B** - Strip Maps). The construction corridor would vary from 50 feet to 60 feet on the flatter ground (eastern end) to an average 100 feet for the remainder of the road. The road would be designed for a speed of 40 miles per hour, and constructed according to the standards of the American Association of State Highway and Transportation Officials (AASHTO) and the Utah Department of Transportation (UDOT) 2005 Standard Specifications for Road and Bridge Construction.

No facilities would be built in association with this alignment. The total new disturbance within the proposed road corridor would be 92.3 acres. Once reclamation is complete, the net loss of vegetation would be 45 acres that are dedicated to the paved roadbed and road shoulder.

All of the build alternatives would conform to the overall guidance of the Fishlake Land and Resource Management Plan (LRMP) and Final EIS, the BLM San Rafael Resource Management Plan (RMP) and Final EIS, and the BLM Forest Planning Unit Management Framework Plan (FPU MFP). This EIS tiers to the decisions of these Land Use Plans, which are available for review at the USFS and BLM offices, both located in Richfield, Utah. No plan amendments would be required for the USFS Fishlake Plan, the BLM San Rafael Plan, or the BLM FPU MFP for the Proposed Action.

The requested rights-of-way for the permanent road corridor would include 24.3 acres of USFS lands, 18.7 acres of BLM lands, 12.3 acres on SITLA lands, and 33.7 acres private lands. Rights-of-way applications have been submitted to the USFS and BLM. Rights-of-way across private lands are dependent upon individual negotiations.

## ISSUES RAISED DURING SCOPING

The agencies initiated public scoping for the Quitchupah Creek Road Project on January 15, 1999, with the intent of preparing an Environmental Assessment (EA). Informal meetings were held in Emery County, including a field meeting March 30, 1999. Other meetings, including the Quitchupah Grazing Association Meeting on January 27, 1999, and the Emery County Public Lands Council Meeting, June 8, 1999, were attended by agency and consultant representatives. Due to the level of public concern for the proposed project, and the issues identified during the scoping process, the USFS and the BLM determined that the proposed project warranted preparation of an EIS. A Notice of Intent (NOI) for the Quitchupah Creek Road EIS was published in the Federal Register on July 1, 1999. The legal scoping notice, Request for Comments, was published in the *Richfield Reaper* July 14, 1999; the *Emery County Progress* July 13, 1999; and the *Salt Lake Tribune* and *Deseret News* July 15, 1999.

A total of 35 comment letters or forms were received as a result of the EIS scoping effort. Approximately 25 comments, previously received during scoping for the EA in January and February 1999, were incorporated into the EIS scoping process for a total of 60 comments. All comments and concerns brought up during scoping can be found in the Scoping Summary and Preparation Plan for the Quitchupah Creek Road Project. As a result of the publication circulation of the Draft EIS in 2001, a total

of 409 comment letters or forms were received during and after the official comment period which was between December 1, 2001 and February 15, 2002. These comments are addressed in Chapter 6.0 of this document and additional information in response to comments has been incorporated into the FEIS.

Issues raised during the scoping and the public comment period that were carried forward in analysis include:

*Water Quality* - Changes may occur to the water quality in Quitchupah Creek and other creeks within the Project Area due to channel realignment and consequent temporary removal of some of the stream-side hydric fringe and wetlands. Water quality may also diminish due to increased sedimentation from disturbed erodible soil sections. An increase in sedimentation in these creeks may increase salinity due to the presence of saline soils in parts of the Quitchupah Creek drainage. A substantial increase in salinity could affect the salinity management of the Colorado River system.

*Soil* - The presence of erodible soils and soils unsuitable as material for roadbed may impact the integrity of the roadbed and could contribute sediments and increased salts into the creek.

*Wetlands* - Some wetlands associated with Quitchupah Creek would be filled during construction of the road. The filled wetlands would not function to filter sediments or absorb flood flows for the creek flow regime. The two proposed filled wetlands presently function as a sediment filter to preserve the water quality of the creek and as flood basins to absorb excess waters and regulate the flows in the channel. The filled wetlands would be mitigated by constructing a small wetland complex, and enhancing an existing wetland within the channel, all at the head of the creek in Convulsion Canyon. The mitigation ratio would be at least 3:1.

A 404 permit would be required from the U.S. Army Corps of Engineers (COE) to fill or impact Waters of the U.S., including wetlands; that agency would take the lead on stream crossings for this project and coordinate with the Utah State Engineers Office.

*Riparian Area* - Riparian zones within the Project Area and those associated with wetlands would be impacted due to construction of the road. In East Spring Canyon, approximately 1,140 feet of the existing channel would be affected by stream realignment; riparian habitat would be re-established downstream of the culvert crossing for approximately 900 feet. The loss of riparian vegetation could impact wildlife and could cause increased sedimentation in the stream. Surface disturbance could also create direct impacts to vegetation, including the potential to encourage the invasion of noxious weeds and/or exotic plants. The plant communities of the Project Area should be identified and mapped to provide data for a more specific analysis.

*Wildlife* - The proposed road could interfere with big game use of the winter ranges and agricultural fields through habitat fragmentation. The potential for vehicle-wildlife collisions and possible mortality may increase due to the construction of and travel on the Quitchupah Creek Road.

*TES Species* - The construction of the road could impact four threatened, endangered, sensitive (TES) plant species.

*Range Resources* – A livestock trail is needed to facilitate continued livestock movement through the canyon.

*Land Use* - Landowners along the proposed route are reluctant to provide rights-of-way across their ranch lands.

*Visual Resources* - The aesthetics and solitude of the remote canyon would be impacted by the high speed roadway and associated increased human activity. The road would dominate the immediate landscape along the route.

*Recreation* - All-terrain vehicle (ATV) use in the creek area would be affected by the highway by limiting access and blocking use of an existing two-track trail. The remoteness and solitude of the canyon would be eliminated due to easy public access along the highway.

*Cultural Resources* - Several known historic and prehistoric sites in the narrow canyon could not be avoided by the proposed road. Known rock art sites would be indirectly impacted through ease of public access, coal truck emissions/pollution, and possibly vibrations.

*Native American Religious Concerns* - During the Native American consultation, the Paiute Tribe stated the entire Convulsion Canyon/Quitchupah Creek area is considered sacred and traditional. The Hopi, who claim affiliation with the Fremont culture, requested that cultural sites remain undisturbed. The Utes requested a one-mile buffer around the rock art sites, and no disturbance of known sites.

*Transportation* - The proposed road would reduce the round-trip coal transport by 50 miles and remove coal transport traffic from portions of Interstate 70 (I-70) and SR-10.

*Socioeconomic* - Emery County has questioned the need for the road and the benefits for their residents. The shorter route would greatly reduce SUFCO Mine transport costs and save energy (fuel). The agricultural community could be impacted by the loss of livestock and timing restrictions.

## ALTERNATIVES

Based on the issues, four alternatives were considered for analysis in this EIS, as follows:

**Alternative A** No Action Alternative (**Environmentally Preferred Alternative**)
**Alternative B** Quitchupah Creek Road Alignment (**Proposed Action**)
**Alternative C** Alternate Junction with SR-10 and Alternate Design of Quitchupah Route
**Alternative D** Water Hollow Road Alignment (**Preferred Alternative**)

### ALTERNATIVE A - NO ACTION (ENVIRONMENTALLY PREFERRED ALTERNATIVE)

Under the No Action Alternative, coal would continue to be transported from the SUFCO Mine to the Hunter Power Plant and railroad loadouts near Price, Utah via the Acord Lakes Road (Sevier County Road #010), I-70, and SR-10. In 2002, two million tons of coal was transported to the Hunter Power Plant, which equates to 52,631 truck trips. An additional one million tons were transported to the railroad loadouts in Carbon County for shipment to eastern customers. Currently and into the foreseeable future, 4.7 million tons of coal per year would be transported west to Levan Loadout.

Under this Alternative, the environment in Quitchupah Creek would remain unchanged in the foreseeable future.

### ALTERNATIVE B - QUITCHUPAH CREEK ROAD (THE PROPOSED ACTION)

The construction of the proposed road would upgrade and realign an existing 9.15 mile long road along Quitchupah Creek, connecting Acord Lakes Road (Sevier County Road #010) in Sevier County with SR-10 in Emery County. The proposed 8.9 mile road is the shortest route of the three project alternatives. It

would reduce the round-trip transport of coal trucks by 55.4 miles as compared to the current Acord Lakes Road route, resulting in a savings of up to 1.6 million gallons of fuel annually.

The route would cross 3.7 miles of private land requiring the acquisition of rights-of-way from six different land owners. At the junction with SR-10, turn lanes and an acceleration lane would need to be added to the highway, which would require widening of the bridge over Quitchupah Creek. Loaded transport trucks would ascend a steep grade on SR-10 that would reduce the speed of northbound traffic (**Figure 1-2**).

No facilities would be built in association with this alignment. There would be temporary impacts to approximately 92.3 acres. Approximately 45 acres would be permanently impacted at the end of construction. The alignment would include 18 primary crossings. Applicant committed measures would include wetland mitigation, construction of a cattle trail, and riparian fencing.

**ALTERNATIVE C – ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN**

This alternate route would detour from the proposed route in the southwest quarter of Section 13, Township 22 South, Range 5 East and proceed east to the junction with SR-10 in the southwest corner of Section 17, Township 22 South, Range 6 East (approximately 1.5 miles north of the proposed Alternative B junction with SR-10). This road would be slightly longer in length (9.1 miles) than the proposed road (Alternative B) but it would bypass the grade on SR-10 that now slows loaded coal trucks, which potentially reduces the speed of other northbound traffic on SR-10. The average grade for this Alternative is 0.6 percent for loaded coal trucks. The loaded coal trucks on Alternative C would access SR-10 at a point 270 feet higher in elevation than the proposed junction near Quitchupah Creek. At the Alternative C junction, the grade for northbound loaded coal trucks on SR-10 is only 0.07 percent. This route would require less elevation change along the travel route and allow loaded coal trucks to utilize their momentum gained while descending Quitchupah Creek Road to ascend the 0.6 percent grade. The route would cross lower Link Canyon channel, as does the proposed route. The total new surface disturbance would be 96.3 acres (**Figure 1-2**).

This Alternate Design would incorporate features to the proposed Quitchupah Creek Road to facilitate livestock movements within allotments, and also facilitate wildlife movements to and from the winter range. The wildlife/livestock facilities would include fencing the road to keep the livestock off the roadway during the grazing season. Approximately 16.3 miles of fence would be installed under this alternate design. It is also proposed that five underpasses approximately 20 feet wide and 70 feet long would be incorporated into this build alternative to facilitate wildlife/livestock access to both sides of the fenced road for grazing purposes. The underpasses would also provide access to Quitchupah Creek, the only watering source in the associated allotments.

Fencing, underpasses, and 1.5 miles of designated livestock trail would allow trailing of livestock along portions of the proposed Quitchupah Creek Road. The alignment would include 22 primary crossings. Applicant committed measures would be the same as for Alternative B.

This road alternative would reduce the coal haul round-trip transport distance by 58.0 miles, as compared to the current Acord Lakes Road route.

**ALTERNATIVE D - WATER HOLLOW ROAD ALIGNMENT (THE PREFERRED ALTERNATIVE)**

Water Hollow is a large northeast-southwest trending drainage that cuts through Old Woman Plateau on the Fishlake National Forest. The Water Hollow Road would utilize the Quitchupah Creek Road Alignment for 2.0 miles of the westernmost portion of its alignment. At this point, it crosses Quitchupah

Creek and follows to the south of this drainage to Water Hollow. This Alternative then continues in an easterly direction to Water Hollow Benches where it then turns south to the Saleratus Benches. From Saleratus Benches, the Water Hollow Road Alternative then turns north and east to connect with SR-10 (**Figure 1-2**).

The Water Hollow Road Alternative alignment heads at about 7,550 feet above mean sea level (AMSL). The proposed road alignment is 11.25 miles long and drops 1,430 feet in elevation for an average grade of 2.5 percent. The descent into Water Hollow from Acord Lakes Road has an average grade of four percent, and the ascent out of Water Hollow onto Water Hollow Bench is seven percent. This alignment crosses several perennial and ephemeral tributary drainages, for a total of 20 primary crossings. The acreage of new surface disturbance for the Water Hollow Road would be 146.3 acres. In addition to the applicant committed measures described under Alternatives B and C, maintenance of existing road, increased fencing, and seeding rangeland would also be done.

This road alternative would reduce the coal haul round-trip transport distance by 46.7 miles, as compared to the current Acord Lakes Road route.

## SUMMARY OF ENVIRONMENTAL IMPACTS

**Table 2.7-1** at the end of Chapter 2.0 Alternatives provides a detailed comparison of all impacts.

### IMPACTS COMMON TO ALL ALTERNATIVES

Common to all of the alternatives, including the No Action Alternative, is the contract commitment by SUFCO Mine for delivery of coal to the Hunter Power Plant near Castledale. One million tons of coal delivered to Hunter Power Plant in 2001 resulted in 105 loads per day traveling east on existing roads. Two and one half million tons of coal delivered in 2002 resulted in 262 loads per day; the maximum transport of 4.5 million tons of coal to Hunter Power Plant would result in 474 loads per day. Coal truck traffic, wear on the roads, and noise levels on SR-10, and in the roadside communities would continue regardless of which Alternative is selected. The continued delivery of coal to the Hunter Power Plant would result in a positive economic effect for Emery County. The coal would provide an economic benefit to Sevier, Emery, and Carbon Counties.

### IMPACTS COMMON TO THE BUILD ALTERNATIVES B, C, AND D

The selection of one of the build alternatives would shift the east-bound truck traffic from portions of I-70 and SR-10 to the new route and also shift noise and human activity to Quitchupah Creek.

The proposed routes for the three build alternatives (B, C, D) junction with Acord Lakes Road (Sevier County Road #010) and traverse east for two miles on a common route dictated by constraints of Convulsion Canyon, the upper canyon of Quitchupah Creek. Within this area there would be impacts to jurisdictional wetlands (JW), riparian zones, and the upper portion of the livestock trail.

*Water Quality* - Improvements in roadway design for the Quitchupah Creek Road, including: implementation of BMPs for runoff control, erosion/sedimentation control, and maintenance; and distancing the road from the creek where possible in combination with the environmental protection measures, would help to reduce the potential for increasing the amount of total dissolved solids in Quitchupah Creek above current levels, though there would be some localized areas of increased erosion due to increased disturbance.

*Wildlife* - Wildlife-vehicle collisions would increase along with increased human presence within the Quitchupah Creek drainage and adjacent remote terrains. Habitat fragmentation would also occur. Wildlife-vehicle collisions would be reduced regionally due to decreased coal transport mileage. Fencing and wildlife crossings would help reduce the potential for wildlife-vehicle collisions.

*Land Use* - Construction and operation of the proposed roadway would change the land use characteristics of the area from a historically remote and rural area to one of increased human activity (i.e., significantly increasing commercial truck traffic) and accessibility.

*Visual Resources* - The Quitchupah Creek Road under any build alternative would be more visible than the existing two-track roadway and there would be a change in quietness and rural character of area. The proposed road, once constructed, would meet the objectives of both the USFS and BLM visual resource management classes.

*Cultural Resources* - Historic and prehistoric cultural sites would be directly impacted from the construction of the proposed road under Alternatives B and C. Historic and prehistoric sites, including the rock art sites, may also be indirectly impacted by the increased public visitation of the area as a result of improved public accessibility.

*Native American Religious Concerns* - Consultation to date by the USFS and BLM has indicated that portions of the area have been historically used by Native Americans and have cultural relevance. The tranquility and solitude of the Quitchupah Creek canyon area, which contains sacred values, would be impacted.

*Socioeconomics* - Cattle ranchers would have a designated cattle trail for approximately 1.5 miles where the terrain restricts free trailing. There would likely be minimal losses due to livestock-vehicle collision. Mine life would be extended by 3 to 10 years (depending upon alternative) due to the increase in economic feasibility with reduced transportation costs.

*Transportation* - At the junction with SR-10, turn lanes would need to be added to the highway.

**ENVIRONMENTAL PROTECTION MEASURES**

The following is a discussion of applicant and agency-committed actions and how they relate to the build Alternatives.

**ALTERNATIVES B & C**

The applicant committed action of eliminating livestock grazing on 4.7 miles of stream in Quitchupah Creek and in Convulsion Canyon would protect the riparian zone and allow the riparian community to colonize bare sites and mature. A fully vegetated riparian community protects the streambanks, shades the water surface reducing evaporation, provides nesting habitat and feeding areas for many species of birds, provides protective cover for mammals and insects, and filters sheet flow from adjacent uplands to reduce sedimentation to the stream maintaining water quality and aquatic habitats.

The project design also provides measures to eliminate or reduce impacts to wildlife where feasible by constructing various mitigation features. The impacted wetlands would be replaced at a minimum of a 3:1 ratio onsite to maintain habitat for wildlife, and the filled perennial stream channels would be fully replaced with new adjacent realigned channels to maintain the riparian zone and aquatic habitat of the stream. An air bath after loading would be required for the coal trucks traveling on the proposed road in order for the trucks to be free of exterior coal debris. Wildlife underpasses constructed under Alternative

C would allow wildlife to pass under the road to avoid the coal truck traffic, and animal carcasses would be removed from the road daily (see **Section 2.2**) to reduce scavenging on the proposed road. The reclamation of disturbed areas not required for operation of the proposed road would be completed as well as unused portions of the existing road/two-track to partially replace the upland habitats lost to road construction.

The restoration of the riparian zone, and the implementation of an improved road drainage system for the new road would help to reduce effects on downstream water quality. In summary, all the riparian habitats would be replaced or restored as well as all the upland habitats, except that required for operation of the road.

### ALTERNATIVE D

The applicant committed action of eliminating livestock grazing on 4.7 miles of stream in Quitchupah Creek and in Convulsion Canyon would protect the riparian zone and allow the riparian community to colonize bare sites and mature. A fully vegetated riparian community protects the streambanks, shades the water surface thereby reducing evaporation, provides nesting habitat and feeding areas for many species of birds, provides protective cover for mammals and insects, and filters sheet flow from adjacent uplands to reduce sedimentation to the stream which maintains water quality and aquatic habitats.

The project design also provides measures to eliminate or reduce impacts to wildlife where feasible by constructing various mitigation features. The impacted wetlands would be replaced at least a 3:1 ratio onsite to maintain critical habitat for wildlife, and the filled perennial stream channels would be fully replaced with new adjacent realigned channels to maintain the riparian zone and aquatic habitat of the stream. The coal trucks traveling on the proposed road would be required, as a performance standard, to be free of exterior coal debris that may become roadside waste and potentially affect water quality in adjacent streams. Bridges would allow wildlife to pass under the road to avoid the coal truck traffic and allow big game movement, and animal carcasses would be removed from the road daily to reduce scavenging on the proposed road.

The reclamation of disturbed areas not required for operation of the proposed road would partially replace the upland habitats lost to road construction.

The restoration of the riparian zone, and implementation of an improved road drainage system would help to minimize downstream water quality impacts. Installing water bars on the existing road, and maintaining those features, would help to reduce some of the ongoing impacts to water quality from the existing road.

In summary, all the critical wildlife habitats would be replaced or restored as well as all the upland habitats except those that are required for operation of the road.

## IMPACTS THAT VARY PER ALTERNATIVE B, C, AND D

### ALTERNATIVE B - QUITCHUPAH CREEK ROAD

The Quitchupah Creek Road, Alternative B, is the shortest route of the three project alternatives, measuring 8.9 miles in length. Under this Alternative, the improved drainage control design and culverted crossings of the creek could help to reduce sedimentation to the creek as now experienced on the unimproved road that currently has uncontrolled drainage and erosion problems. Forty percent of the route would be in erodible soils adjacent to the creek.

Biological clearance prior to roadway construction would allow for mitigating actions to reduce impacts to threatened, endangered, and sensitive (TES) species habitat. The construction of the road would remove four animal unit months (AUMs) of forage from the grazing allotments and 1.4 acres of cultivated pasture.

There are known cultural resource sites located where the terrain restricts road alignment; these would be impacted by the road construction. There would be the potential for indirect impacts to cultural resource and rock art sites due to accessibility.

The route would cross 3.7 miles of private land requiring the acquisition of rights-of-way from six different landowners. The junction with SR-10 would require widening of the bridge over Quitchupah Creek. Loaded coal trucks must also ascend a steep grade on SR-10 that would reduce the speed of northbound traffic, necessitating the construction of a northbound acceleration lane.

The road would reduce the round-trip coal transport route by 55.4 miles and result in a savings of up to 1.4 million gallons of fuel annually. Economic benefits would accrue to the SUFCO Mine from the cost savings and to the economy of Sevier County due to the increased profitability of the mine.

**ALTERNATIVE C - ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN**

This route is identical to the proposed Quitchupah Creek Road except for the inclusion of additional fencing and underpasses to facilitate wildlife/livestock use of the forage adjacent to the road and for movement of livestock along the creek. Also, the last two miles of this route deviates 1.5 miles to the north to junction with SR-10 above the grade that impedes northbound traffic due to the slowing of the truck traffic.

Impacts are similar to those summarized under Alternative B, except the road would be slightly longer at 9.1 miles. However, it would save 58 miles on the round-trip travel route, as compared to the current Acord Lakes Road route since it ends up 1.5 miles further north on SR-10; saving up to 1.5 million gallons of fuel annually. The route would also be more efficient for the truck transport because the loaded coal trucks would use the momentum gained descending Quitchupah Creek to ascend the 0.6 percent maximum grade and junction with SR-10 at a level grade.

This road alternative has the potential to impact cultural sites along Quitchupah Creek, as described under Alternative B. In addition, implementation of Alternative C has the potential to impact cultural sites located at the Link Canyon crossing.

The road would cross 2.9 miles of private land, requiring the acquisition of rights-of-way from two landowners.

**ALTERNATIVE D - WATER HOLLOW ALIGNMENT**

The Alternative D road deviates from the proposed Quitchupah Creek Road after exiting Convulsion Canyon by traversing Water Hollow, a perennial stream. It then crosses Water Hollow and Saleratus benches before descending to junction with SR-10 south of Quitchupah Creek. The Alternative D road traverses steeply incised terrain that would require extensive cut and fill construction.

Because the alternative diverges from Quitchupah Creek, it would result in the construction of a new roadway alignment, 11.25 miles in length. Under this scenario, the existing Quitchupah Creek two-track road would remain open up to the Forest boundary. The two-track road would continue to contribute sediments into the Creek, however water bars would be constructed to help control drainage and erosion.

The existing Water Hollow and Saleratus benches provide big game winter range. Under this scenario, the construction of a road across the benches would disturb big game habitat and movement along the road corridor and would greatly increase the potential for wildlife-vehicle collisions. Elk crossings installed in several drainages would help to reduce this potential. The potential to impact habitat for sensitive plant species is low.

Livestock-vehicle collisions would be minimized on the proposed Water Hollow Alignment by fencing. The grazing allotment would be managed as a two pasture allotment. Water would be hauled to both pastures of the allotment on the benches to reduce trailing to water and provide for better distribution of livestock in the allotment. A cattle trail would be constructed along the westernmost 1.5 miles, as it would be for Alternatives B and C.

The road would cross 0.53 miles of private land and require a right-of-way from one landowner. The route would avoid all eligible cultural sites and would not be near known rock art sites.

The Water Hollow Alternative would result in the construction of a slightly longer road than the other alternatives and would require loaded coal trucks to ascend steep 7 percent grades. Under this Alternative, the round-trip coal haul transport distance would be shortened by 46.7 miles, as compared to the current Acord Lakes route. The resulting savings on fuel would be approximately 1.4 million gallons annually. The junction with SR-10 would be on level grade with good sight distance.

# Chapter 1

# Introduction

# 1.0 INTRODUCTION

This Environmental Impact Statement (EIS) considers a single proposed Federal action, with alternatives, and is a joint document between the United States Forest Service (USFS), Fishlake National Forest (Lead Agency) and the Bureau of Land Management (BLM), Richfield Field Office (Cooperating Agency). This National Environmental Policy Act (NEPA) analysis will consider the potential environmental consequences associated with implementing the Proposed Action and Alternatives, as described below.

The Sevier County SSD has submitted right-of-way applications to the USFS and the BLM for consideration of the construction of the Quitchupah Creek Road, a public road. The Quitchupah Creek Road would be generally located between the Acord Lakes Road (Sevier County Road #010) and a junction with State Route 10 (SR-10) (**Figure 1-1**). Lands along the proposed route are administered by the USFS, the BLM, and Utah State School and Institutional Trust Lands Administration (SITLA), all headquartered in Richfield, as well as private interests.

The Proposed Action involves consideration of Sevier County Special Service District (SSD) Number 1's right-of-way applications for construction of the Quitchupah Creek Road. NEPA requires that the environmental analysis compare alternatives to satisfy the identified purpose and need of the Proposed Action, to disclose environmental effects, analyze opportunities, and to resolve issues. The resolution of issues related to this project has been an ongoing and lengthy process. After initial public scoping in 1999-2000 (see **Section 1.6**), the Quitchupah Creek Road Draft EIS was circulated for public review and comment at the end of November 2001 (See Chapter 6 – Public Comments and Responses). Although the comment period was from December 1, 2001 through February 15, 2002, comments received after that time were also reviewed and included. Since that time, the EIS has been complicated by a changing BLM and FS staff of resource specialists and managers (due to transfers and retirement), and additional required studies for specific resources, such as the Ethnography Study conducted in 2004. This Final EIS takes into account a plethora of public and agency concerns, issues and views, as well as adapting to changes in land use policy and guidelines.

Decisions to be made, authorizing actions, and a description of the Federal right-of-way application process are further discussed in the following sections.

## 1.1 Purpose and Need

The purpose of the Federal action is to respond to a request from Sevier County SSD for granting a right-of-way to construct a public road. Southern Utah Fuel Company Mine (SUFCO Mine) would then be a toll user of this public road. Due to the SUFCO Mine location in rugged terrain, and the distance to railheads and loadouts, SUFCO Mine relies on truck transport for all of its coal shipments. The need for the road project is to ensure the competitive productivity of the SUFCO Mine, as a source of economic stability for Sevier County, a potential source of additional income and revenue for Emery County, and a source of high quality coal for electrical power generating plants in eastern Utah and the Midwest.

The recently signed National Energy Policy Act 2005 seeks to provide reliable, affordable energy to our nation's consumers, and to lessen the impact on Americans of energy price volatility and supply uncertainty. The demand for electricity in the U.S. is projected to increase by 45% over the next 20 years (National Energy Policy website). Access to coal reserves via any of the road alternatives proposed in this document would reduce fuel waste by shortening the transport routes, and would help to maintain supplies of diverse and traditional forms of energy within the U.S. (domestic oil, gas and coal). The National Energy Policy promotes such improvements in the productive and efficient use of energy.

The SUFCO Mine, operated by Canyon Fuel Company, LLC was Utah's largest coal producer in 2004, and produced a near-record high of 6.87 million tons. SUFCO and dependent trucking companies provided 20 percent of the non-farm employment and 28 percent of the personal income in Sevier County in 2002. The mine is an important component of local economies. The presence and stability of the SUFCO Mine, and the families who support it, guarantee a continued demand in both Sevier and Emery counties for bank loans, mortgages, utilities, and other goods and services. This adds to the economic stability of both counties.

Profitability of the SUFCO Mine over time ensures that funds are available for further exploration, and maintains the SUFCO Mine's level of production and competitive edge in the marketplace. The added profits, due to reduced transport costs, substantially lower risk of failure for the SUFCO Mine, and provide a buffer to economic consequences for Sevier County and to a lesser extent Emery County.

As companies mine toward the edge of coal deposits, mining is usually stopped because the mining conditions result in the cost of coal production exceeding the market price of coal. The decrease in transportation costs would allow some of the coal that otherwise would not be recovered due to excessive mining costs to be mined profitably without an increase in the selling price. Effective mining of the marginal portions of the SUFCO reserves could result in recovery of an additional 11 to 43.9 million tons of coal if the road were authorized.

Under the Mineral Leasing Act of 1920, regulations provide that any resource recovery and protection plan must achieve maximum economic recovery of the coal resources.

The purpose of this EIS is to evaluate the potential environmental, social, and economic consequences of granting rights-of-way to construct a public road across Federal and other lands.

## 1.2 General Location and Description of Proposed Road

Sevier County SSD has proposed the upgrade and realignment of an existing 9.15 mile road along Quitchupah Creek, to connect the Acord Lakes Road (Sevier County Road #010) in Sevier County with SR-10 in Emery County. The proposed 8.9-mile Quitchupah Creek Road (Alternative B) would intersect SR-10 in the N½ of Section 30, Township 22 South, Range 6 East, Salt Lake Base Meridian (SLBM). Continuing to the northwest into Sevier County, and then westward, the road would generally follow an existing trail along Quitchupah Creek, into Convulsion Canyon, where it would connect with the paved Acord Lakes Road in SW¼ of Section 11, Township 22 South, Range 4 East, SLBM. **Figure 1-1** presents the project's regional location. The alignments considered for Quitchupah Creek Road are presented in **Figure 1-2**. **Figure 1-3** presents the current transportation route in comparison with the Proposed Action and Alternative routes. Legal descriptions of each of the project components are given in **Appendix A**.

The proposed 8.9 mile road (Alternative B) would be a 28-foot wide paved surface, with an operational right-of-way of 66 feet. Several pullouts would be provided at various locations (see **Appendix B - Strip Maps**). The construction corridor would vary from 50 feet to 60 feet on the flatter ground (eastern end) to an average 100 feet for the remainder of the road. The road would be designed for a speed of 40 miles per hour, constructed according to the standards of the American Association of State Highway and Transportation Officials (AASHTO) and the current Utah Department of Transportation (UDOT) Standard Specifications for Road and Bridge Construction.

No facilities would be built in association with this alignment. The total new surface disturbance under this Alternative would be 92.3 acres. Once reclamation is complete, the net loss of vegetation would be about 45 acres that are dedicated to paved road surface/shoulder.

The Project Area includes all the terrain that would be affected by the proposed road alternatives (B, C, and D). The proposed Quitchupah Creek Road alignment (Alternative B) is generally east-west. Within the span, an approximately 1,600-foot change in elevation occurs. The proposed road junctions with SR-10, a north-south highway route that extends from Interstate 70 (I-70) on the south to U.S. Highway 6 on the north. The Project Area contains a diverse set of climatic, geologic, physiographic, and ecosystem characteristics.

**REGIONAL CHARACTERISTICS**

From a regional perspective, the Project Area is predominantly located within the Basin and Range - Colorado Plateau Transition Physiographic Province (Stokes, 1986); it is marked by gently rolling or near-flat surfaces, through which drainages have dissected the otherwise gentle topography. The drainages typically form steep canyons cut through sedimentary rock. Adjacent to the High Plateaus, the eastern edge of the Project Area is located within the Mancos Shale Lowlands Subsection of the Canyonlands Section of the Colorado Plateau Province. Topography in this Subsection is influenced by the weak sedimentary rock at the eastern base of the High Plateaus.

The majority of the Project Area can be classified as a Steppeland climate, according to the modified Köppen System (Weber State College, 1981). Steppelands are located between the true desert areas and the higher mountains. They are generally semi-arid, with annual evaporation exceeding annual precipitation; a summer moisture deficit is typical. The western-most edge of the Project Area borders on Undifferentiated Highlands, according to the modified Köppen System, and has a less significant moisture deficit.

The regional physiography and climate influence vegetation characteristics. Located within the Upper Sonoran and Transition Vegetation Zones, the area contains a variety of vegetative types and habitats ranging from forest to brush-dominated communities to sparse small desert shrub lands. The presence of water further modifies these vegetative types, and localized areas of riparian and wetland communities are also found.

**LOCAL CHARACTERISTICS**

At the upper, western end of the proposed road, the Project Area is still in the southern part of the north-south trending Wasatch Plateau. Following along a major dissection in the Plateau, the Convulsion Canyon/Quitchupah Creek drainage traverses and descends the east side of the Plateau and continues out of canyon confines. The Water Hollow Benches are south of Quitchupah Creek. They are highly dissected with numerous ephemeral drainages that cut through the bench surfaces. The eastern portion of the Project Area crosses shale flats to the alignments' terminus at SR-10. It is here, as each alignment drops from the high plateau country to the flatland, where Project Area characteristics vary significantly.

As mentioned above, the Project Area is associated with a canyon complex that dissects the plateau surface. The proposed Quitchupah Creek Road alignment traverses, and cuts through, numerous sedimentary geologic formations as it makes its way eastward across the plateau. These formations include the Mesaverde Group and the Mancos Shale Group.

The horizontally bedded nature of these formations, as well as textural and lithologic differences in the formations, is evident from the steep canyon walls, escarpments, and badlands visible in the Project Area. Flat ledges, vertical cliffs, and sloping erosional and depositional surfaces all contribute to the varied relief in the Project Area. Faulting and fracturing also affect the local topography, and in fact, the location of Quitchupah Canyon and its tributaries are likely dictated by the geologic structure.

The Project Area is located in the Quitchupah Creek watershed, which is part of the Colorado River system. At its upper end, where it is known as Convulsion Canyon, the watershed collects flows from small tributaries. Water Hollow, the North Fork of Quitchupah Creek, and Link Canyon Wash are three of the larger tributary channels that drain toward the Project Area. The Water Hollow Benches area to the south of Quitchupah Creek has numerous ephemeral drainages that head primarily southeast toward the creek. These drainages and tributaries have had a major influence on the area's topography as they cut down through, and laterally across, the valley bottom sediments.

The climate and physiography within the majority of the Project Area has generally not been conducive to extensive soil development; vegetation is sparse over much of the Project Area. However, at the upper, western-most end, where climate and topography are more amenable, soils with defined horizons and an organic component have developed over time and have not eroded away. They support pine, aspen, scrub oak, and mountain mahogany, as well as significant understory vegetation.

Over most of the rest of the area, significant exposed bedrock occurs adjacent to the proposed and alternate road alignments. Many other areas where soil development has occurred have been subject to extensive erosion by wind and water. These areas support only sparse vegetation, ranging from scattered pinyon and juniper woodlands with sparse understory to low density desert brush lands where shadscale and other salt bush communities dominate. The former floodplain (now terrace) of Quitchupah Creek contains well-developed soils that support sagebrush/grass vegetation communities. The perennially flowing stream corridors of Quitchupah and Water Hollow creeks support a varying mixture of riparian species.

In addition to the function of the Project Area in filling various habitat niches for wildlife, livestock grazing has occurred within the bounds of the Project Area for many years. These land uses are the predominant ones within the sparsely populated region.

## 1.3 Relationship to USFS/BLM Policies, Plans, and Programs

The San Rafael Resource Management Plan (RMP) (1991) and the Forest Planning Unit Management Framework Plan (FPU MFP) (1982) guide the management of BLM public lands in the area. Under the FPU MFP, decisions on right-of-way applications are made according to analysis of each application. The USDA Fishlake National Forest Land and Resource Management Plan (LRMP) (1986) guides resource management activities for the Fishlake National Forest lands including the western portion of the Project Area. These management plans are currently in the revision process, but remain in effect until that process is finalized. However, while the plans are being revised the actions the agencies can take are limited by 40 CFR 1506.1. Specifically, during the NEPA process, "Until an agency issues a record of decision as provided in 1505.2, no action concerning the proposal shall be taken which would: 1) have an adverse environmental impact; or 2) limit the choice of reasonable alternatives." The BLM Richfield Field Office RMP is expected to be finalized in the spring of 2006 and will provide future direction for managing the public lands in Sevier County and additional areas. The BLM Travel Plan, due out in 2006 after the release of the final RMP, will designate a system of trails for off-highway vehicles (OHVs). The Richfield RMP will designate areas where proposed projects, such as OHV sites, are acceptable on BLM land.

The planning process for the Dixie and Fishlake National Forests (NF) Forest Plan Revision is ongoing and has included numerous public meetings and workshops. The Draft Management Direction Package for the Fishlake National Forest was released April 28, 2005. The Fishlake NF LRMP is expected to be finalized the end of 2006.

The current management prescription for the Forest lands in the Project Area emphasizes livestock grazing via intensive management level D for range resources (See **Section 3.8**, Range Resources). Also included in the Project Area is *Area Travel Restriction C*, which denotes lands closed year-around to all motorized vehicle travel. Travel Area C includes The Cove on Old Woman Plateau and a trail in Water Hollow. However, road system expansion to accommodate mineral activities is allowed. The Fishlake National Forest OHV Route Designation Plan is scheduled to be implemented in the summer of 2006. This Plan will designate roads, trails, and open areas for the use of OHVs. The rules and designations in the Plan will close the Forest to off-route motorized cross-country travel by OHVs, except in the designated areas. This plan will improve management and enforcement of OHV use on Forest land.

There are no designated BLM Areas of Critical Environmental Concern (ACECs) in or near the Project Area. However, the Quitchupah Creek – Trough Hollow ACEC has been nominated under the current land use planning effort for the BLM's Richfield Field Office. The ACEC would include Quitchupah Creek drainage, Link Canyon, and Trough Hollow, and would involve the majority of the EIS Project Area, excepting the Water Hollow and Saleratus benches. Further, Quitchupah Creek, from the Fishlake National Forest boundary to the Sevier/Emery county line (crossing 1.3 miles of BLM land) was determined eligible for possible designation as a Wild and Scenic River during the initial phase of Richfield BLM's land use planning update process.

This EIS tiers to the FEISs of these Land Use Plans, which are available for review at the USFS and BLM offices, both located in Richfield, Utah. See also **Section 3.9** regarding compliance with Emery County and Sevier County planning documents.

## 1.4 Decisions to be made By Responsible Officials

This EIS addresses the need for Federal decisions approving a right-of-way application, or an alternative, which would cross Federal lands. The Forest Supervisor for the Fishlake National Forest and the Field Manager for the Richfield Field Office of the BLM are the responsible officials for the EIS. They will make their respective decisions regarding the Proposed Actions after considering the comments, responses, and environmental consequences discussed in the EIS. The rationale for each agency decision will be documented in separate Records of Decision (RODs). No plan amendments would be required by either the USFS Fishlake LRMP, the BLM San Rafael RMP, or the BLM Forest Planning Unit MFP in order to implement the Proposed Action or Alternatives.

## 1.5 Authorizing Actions

In addition to this EIS, approval of the Proposed Action or an Alternative would require authorizing actions from other Federal, State, or local agencies with jurisdiction over the project. Authorizing actions include rights-of-way, land use and environmental permits, and approvals. **Table 1.5-1** presents the principal authorizing actions required for the Proposed Action or an action Alternative.

**Table 1.5-1 Summary of Permits and Approvals Required for the Quitchupah Creek Road Project**

| Permit/Approval | Granting Agency |
|---|---|
| **Permits Required by the Record of Decision** | |
| Public Road Easement issued to Sevier County* | U.S. Forest Service |
| Right-of-Way Grant* | Bureau of Land Management |
| Temporary Use Permit* | Bureau of Land Management |
| Farmland Protection Policy Act Farmland Conversion Impact Rating* | Natural Resources Conservation Service |
| Clean Water Act Section 404 Permit* | U.S. Army Corps of Engineers |
| Stream Alteration Permit (may be covered under 404 permit above) | Utah Division of Water Rights Stream Alteration |
| Section 7 Consultation | U.S. Fish and Wildlife Service |
| Cultural Resource Concurrence | State Historic Preservation Office |
| **Permits Required for Construction of Road** | |
| Fugitive Dust Control Plan | Utah Department of Environmental Quality |
| Encroachment Permit | Utah Department of Transportation |
| Easement Application | Utah School and Institutional Trust Lands Administration |
| Right-of-Way Acquisition | Private Landowners |
| National Pollution Discharge Elimination System Permit for Storm Water | Utah Department of Environmental Quality, Division of Water Quality |
| Surface Disturbance Permit, Air Quality | Utah Department of Environmental Quality, Division of Air Quality |
| Cultural Resource Concurrence (possibly Research Design/Memorandum of Agreement) | State Historic Preservation Office |
| Construction Permit | Emery and Sevier Counties |

*Federal permit, or other entitlement that must be obtained in implementing the proposal. (40 CFR 1502.25(b))
CFR=Code of Federal Regulations.

## 1.6 Issues

**PUBLIC INVOLVEMENT PROCESS**

Public involvement is an important part of the environmental analysis process. The Public Involvement Plan describes the methods and techniques that will be used to involve the public in the environmental analysis. It allows the public to participate actively in the NEPA process and to communicate their concerns regarding the Proposed Action. In addition, involvement of local, State, and other Federal agencies helps these entities to anticipate the effects and benefits that could occur from the project, then make necessary plans and changes in public policy.

The USFS and BLM initiated public scoping for the Quitchupah Creek Road Project on January 15, 1999 with the intent of preparing an EA. Informal meetings were held in Emery County, including a field meeting on March 30, 1999. Other meetings including the Quitchupah Grazing Association Meeting (January 27, 1999) and the Emery County Public Lands Council Meeting (June 8, 1999) were attended by agency and consultant representatives. Due to the level of public concern for the proposed project, and the issues identified during the scoping process, the USFS and the BLM determined that the proposed project warranted preparation of an EIS. A Notice of Intent (NOI) for the Quitchupah Creek Road EIS was published in the Federal Register on July 1, 1999. The legal notice, Request for Comments, was published in the *Richfield Reaper* July 14, 1999; *Emery County Progress* July 13, 1999; *Salt Lake Tribune* and *Deseret News* July 15, 1999.

A public mailing list was compiled and 160 letters were sent to interested individuals, agencies, and groups. Public meetings were held as scheduled in Castle Dale on July 21, 1999 at the Museum of the San Rafael, and in Richfield on July 22, 1999 at the Quality Inn Center. Comment forms were available at the meetings. Over 30 people attended the Castle Dale meeting and 23 people signed in at the Richfield meeting. A complete summary of the public participation is available in the Public Involvement Plan on file at the USFS Fishlake National Forest Office and the BLM Richfield Field Office.

The following official site tours were conducted in Quitchupah Canyon:

| | |
|---|---|
| June 4, 1999 | Representatives of the Paiute Indian Tribe of Utah |
| June 30, 1999 | Agency and Sevier County SSD Representatives |
| July 15, 1999 | Concerned Individuals of Emery County |
| August 6, 1999 | Representatives of the Koosharem Band of the Paiute Indian Tribe of Utah |
| March 30, 2000 | Representatives of the Uinta and Ouray Ute Indian Tribe of Utah |
| October 18, 2000 | Representatives of the Koosharem Band of the Paiute Indian Tribe of Utah |
| August 22, 2002 | Ranchers |
| June 3, 2003 | BLM, USFS, and BLM State Director |
| August 28, 2003 | State of Utah Resource Development Coordinating Committee |
| September 14, 2004 | Representatives of the Paiute Indian Tribe of Utah |

Rock art groups and Historical Society members are familiar with and have also visited the canyon.

A total of 35 comment letters or forms were received as a result of the EIS scoping effort. Approximately 25 comments had previously been received during scoping for the EA in January-February 1999. Consultation with interested parties has been on-going throughout the NEPA process, for both the EA and

the EIS. The decision was made by the USFS and BLM to carry over all comments made during the EA scoping into the official record of scoping for the EIS. Those who provided comments on the EA have maintained their standing in the EIS process.

The Quitchupah Creek Road Draft EIS was prepared and circulated for public review and comment in November 2001. Comments received on the Draft EIS were reviewed by the BLM and FS, and based upon these, additional information has been gathered and/or revisions made to the EIS. The 409 correspondences received on the Draft EIS are represented in Chapter 6 along with BLM/FS responses.

**KEY ISSUES CARRIED FORWARD IN ANALYSIS**

The scoping comments were examined for common themes, then combined, as appropriate, into issues. The issues were further organized by resource or issue topic. Based on internal discussions, the issues were organized by resource into key issues to be carried forward as the focus for analysis in the EIS. See the Summary of Public Scoping (JBR, January 2000) for all the comments, and the Significant Issues Document (JBR, February 2000) for details on the selection of key issues. These documents are on file at the USFS Fishlake National Forest and the BLM Richfield Field Office, Utah.

In addition to issues identified during scoping, the BLM's "Critical Elements" are reviewed in this document. These include: Air Quality, Areas of Critical Environmental Concern, Cultural Resources, Environmental Justice, Floodplains, Invasive and Non-native species, Migratory birds, Native American Religious Concerns, Prime or Unique Farmlands, Special Status Species, Wastes - Hazardous or Solid, Water Quality (surface and ground), Wetlands and Riparian zones, Wild and Scenic Rivers, and Wilderness (including BLM WSAs). The following Critical Elements are resources that are described and dismissed in Section 3.0 as not occurring in the Project Area, or not affected by the proposed project or alternatives: Air Quality, Noise, Environmental Justice, and Wastes – Hazardous or Solid. The other Critical Elements listed above are carried forward for analysis.

## Key Issues and Indicators

***Water Quality***

Changes may occur to the water quality in Quitchupah Creek and other creeks within the Project Area due to channel realignment and consequent temporary removal of some of the stream-side hydric fringe and wetlands. Water quality may also diminish due to increased sedimentation from disturbed erodible soil. Increases in sedimentation in these creeks could increase salinity due to the presence of saline soils in some parts of the Quitchupah Creek drainage. A substantial increase in salinity could affect the salinity management of the Colorado River system.

Improvements in roadway design for the Quitchupah Creek Road, including: implementation of BMPs for runoff control, erosion/sedimentation control, and maintenance; and distancing the road from the creek where possible; along with the proposed riparian protection projects, would help to minimize increases in the amount of total dissolved solids (TDS) in Quitchupah Creek, in spite of some localized areas of increased erosion due to increased area of disturbance.

Indicators: Salinity
Sedimentation potential
Number of potential culverts/crossings

***Soils***

The presence of highly erodible soils and shrink-swell soils, and consequently potentially unstable soils, in the middle stretches of the Quitchupah Creek area, would increase road design and construction efforts. The proposed road alignment in the Quitchupah Creek area is located on areas of erodible soils as defined by Natural Resources Conservation Service (NRCS). The unstable soil areas will be a high maintenance item in the future as evidenced by maintenance requirements in the unstable areas within the SR-10 alignment. The disturbance of erosive soils also contributes sediments and salts to the creek. Farmland soils would be impacted under Alternatives B and C.

Indicators: Percentage of potentially unstable soils
Acres of farmland soils impacted

***Vegetation***

Riparian zones within the Project Area and those associated with wetlands would be impacted due to construction of the road, but would be replaced within the replacement channel in East Spring Canyon. The loss of riparian vegetation could impact wildlife and could cause increased sedimentation in the stream. Surface disturbance could also create direct impacts to vegetation, including the potential to encourage the invasion of noxious weeds and/or exotic plants. The plant communities of the Project Area should be identified and mapped to provide data for a more specific analysis. Grazing restrictions could add some protection to riparian areas.

Indicators: Potential acreage of riparian zone impacted
Potential acreage of disturbance susceptible to noxious weed invasion

***Wildlife***

The proposed road in the Project Area could interfere with big game use of the winter ranges on the benches and in the agricultural fields. Fencing of the road could become a barrier to big game migration and also to daily movements between the fields and cover in the nearby hills. Traffic on the roads in the form of large loaded trucks going downhill would be a hazard to all wildlife, especially big game and raptors.

Raptor nesting within the Project Area could be affected by road construction and operation. The increased activity during critical nesting periods may cause raptors to abandon active nesting sites.

Indicators: Location of big game migration corridors
Raptor nesting locations

***Fisheries/Macroinvertebrates***

Increased sedimentation and destabilization of Quitchupah Creek and other creeks in the Project Area could impact fisheries and aquatic macroinvertebrates in the stream. The loss of the hydric fringe and stream-side wetlands could affect the reproductive success of fish species and some macroinvertebrates species that depend on vegetation for cover and prey.

Indicators: Stream-length within Project Area
Acreage of hydric fringe/stream-side wetlands potentially impacted
Presence of fish in Quitchupah Creek
Existing macroinvertebrate populations

***Threatened, Endangered, and Sensitive Species***
Originally four species of threatened, endangered, or sensitive (TES) plants were suspected by BLM of occurring in the Project Area. However, additional information supplied by Lori Armstrong of the BLM and Bob Campbell of the USFS indicates that there is the potential for five species of TES plants to occur in the Project Area. Each TES plant species would need to be identified and mapped in the Project Area to ensure the road design avoids or minimizes impacts to these TES plants.

The flannelmouth sucker and the leatherside chub, State and BLM sensitive fish species, occur in the lower portion of Quitchupah Creek. The bluehead sucker has been recorded in Quitchupah Creek below the Project Area, at the confluence with Ivie Creek. The potential of increased sedimentation and stream destabilization may minimally affect these fish species. Their presence in the existing active, high TDS, flashy stream system suggests some degree of environmental tolerance.

Implementation of the proposed project requires Section 7 Consultation with the U.S. Fish and Wildlife Service (USFWS).

Indicators: Acreage of identified TES plant species habitat within Project Area
USFWS opinion

***Range Resources***
Livestock grazing is a traditional use of the Project Area. Livestock are wintered in the Quitchupah Creek area on the lower benches and in the agricultural fields. Livestock are moved to and from the summer range on Forest lands by trailing along Quitchupah Creek. The presence of a road would change the way livestock are trailed along the creek, causing changes in traditional ranching methods. The presence of a road would increase the need for the construction of more fences and other facilities to keep livestock off the road and allow them to trail and graze in adjacent areas of forage and water. The additional fences and facilities would increase the operating and maintenance costs for the rancher. There would also need to be parking areas for the livestock trucks and trailers along the road (pullouts are planned for East Spring Canyon). The riparian fencing on public lands would alter the way livestock are watered.

The road presents a hazard, in the form of vehicle-livestock collisions, to any livestock that enter onto the roadway. The ranchers predict an increase in livestock loss due to collisions on the road, similar to what is now being experienced on the Acord Lakes Road. There would be some loss of feed production in the agricultural fields in the Project Area due to the proposed road alignment and the removal of a small acreage of agricultural lands from production.

Indicators: AUMS potentially lost
Acreage of feed production field potentially impacted
Change in area available for livestock to water

***Land Use***
Land uses in the Project Area would increase. Permitted facilities in the Project Area include the drainfield for the mine wastewater system in Convulsion Canyon, the power line that follows the creek, and the irrigation system for the agricultural fields adjacent to the creek. The road would provide easier access to the area which could increase the types and intensity of land use.

Indicators: Potential land use changes

***Visual Resources, Recreation, and Wilderness***

The road would change the nature of the Project Area. The aesthetics of a remote but accessible creek area with several scenic canyons would change to an easily accessible area with the possibility of increased public use. There would be a loss of natural beauty and quietness along the creek. The road would be readily visible in the landscape and would attract the attention of the casual visitor, in contrast to the existing two-track road which is barely visible against the landscape. The views in the Project Area would be affected by the presence of the road. The BLM public lands are a Visual Class IV, which means that changes which dominate the landscape are permitted. The National Forest System lands Visual Quality Objective (VQO) is modification, which indicates activities within the area can be visually dominant.

Although access to the public lands and the National Forest System would be made easier with the construction of the proposed road, the recreational experience within the Project Area would be changed. The emphasis on traditional uses of ranching, hunting, trapping, and remote country adventure would change with increased tourism and public use. Those who advocate all-terrain vehicle (ATV) use have requested an ATV trail be constructed alongside the road to allow continued access into the Forest lands. The construction of a paved road on the current road alignment, where ATVs presently travel at will, would restrict access for ATV users. There would be pull-offs and parking along the paved road at several locations, such as near livestock facilities (see Appendix B- Strip Maps). Those who enjoy the peacefulness and solitude of the canyon would see a change. Hunting use may decrease due to the number and frequency of transport truck traffic causing displacement of wildlife.

Wilderness and roadless areas issues were raised but no wilderness or inventoried roadless areas are designated on the Forest or public lands near the Project Area. The Project Area is not affected by the USFS moratorium on road maintenance or construction in inventoried roadless areas.

Indicators: Visual Class and potential compliance
Potential restrictions/changes to recreational opportunities

***ACECs and Wild & Scenic Rivers***

Quitchupah Creek, from the Fishlake National Forest boundary to the Sevier/Emery county line (crossing 1.3 miles of BLM land) was found to be eligible for possible designation as both an ACEC and a Wild & Scenic River during the initial phase of the Richfield BLM's land use planning update process. The July 2004 evaluation of outstandingly remarkable values determined that the nominated cultural values were outstanding; the nominated ecological values were determined not outstanding. Once values of a possible ACEC or Scenic River (or segment) crossing public lands has been determined eligible, the river corridor is managed to protect the outstandingly remarkable values for which it is nominated, until a suitability determination is made.

Indicators: Potential impacts to eligible ACEC and/or Wild & Scenic Rivers values
Draft RMP determination

***Cultural Resources and Paleontology***

Numerous cultural resource sites are present in the Project Area and several would likely be impacted by the proposed project. Cultural affiliations include the Archaic, Fremont, and EuroAmerican cultures. Highly visible rock art sites are more susceptible to impacts as these sites become more accessible to the public. The relatively remote nature of the rock art site setting would be compromised by the presence of the paved road.

There is concern for historical sites in the Project Area. Several individuals feel that their historical and personal connection to the Quitchupah Creek area would be greatly affected by the road construction and operation. Historically the area has been used for cattle grazing/trailing. Both Emery and Sevier Counties' economic histories are based on cattle ranching and livestock in general.

Indicators: Number of known NRHP Eligible cultural resource sites potentially impacted
Number of known significant paleontological sites potentially impacted

***Native American Concerns***
As a result of the Native American consultation, the Paiute, Hopi, and Ute tribes have expressed concern over the proposed project. The Paiute Indian Tribe has stated that the canyon is sacred to them and the rock art sites represent traditional use of the area. The Ute Indian Tribe has expressed concern that the proposed road will lead to impacts to the rock art present in the area and request a one-mile buffer. The Hopi, who claim affiliation with the Fremont culture, have requested that no prehistoric sites be disturbed.

Indicators: Potential sacred values impacted
Potential Traditional Cultural Properties impacted
Potential sites of traditional importance impacted
Potential disturbance to rock art and other cultural resource sites

***Transportation***
A new rural collector road system would be developed that would link the Acord Lakes Road with SR-10, thus bypassing I-70. The proposed road would facilitate transporting coal to the east by reducing the round-trip distance by more than 50 miles. The road would also reduce the distance for coal mine service providers located in Carbon County traveling to the SUFCO Mine. Carbon County is the center for the coal mine service industry. The proposed road would be an alternate access to the SUFCO Mine providing increased mine safety. The new road would lessen coal truck traffic on a stretch of SR-10 from the I-70 junction north to the new junction near Emery. The coal truck traffic from the Quitchupah Creek area would still be routed through the town of Emery. The road would open access to alternative customers in the local area and in eastern coal markets.

There is concern regarding the location and design of the junction of the proposed Quitchupah Creek Road with SR-10. The proposed junction is adjacent to a bridge that would need to be widened to facilitate the placement of turn and acceleration/deceleration lanes. Just north of the proposed junction is an increase in the grade on Quitchupah Hill that slows northbound trucks and may interfere with the regular movement of traffic. Accelerating trucks may be slowed by the grade, consequently slowing northbound traffic on SR-10.

Reducing the coal transport round-trip east would increase the competitive balance for the SUFCO Mine with the other coal mines in Emery and Carbon Counties that are close to loadouts.

The need for the road on the basis of the round-trip transport distance for the SUFCO Mine, mine safety, and the increased access to the Acord Lakes area has been questioned by project opponents.

Indicators: Potential junction requirements
Potential distance savings

***Socioeconomics***
Residents of Emery County are concerned whether construction of the road would lead to increased economic benefits to Emery County, and if so, would these benefits from the proposed road outweigh perceived environmental and social impacts?

Coal mining provides economic benefits such as employment, payroll, Federal coal royalties, and tax revenues on a local and regional level. Would these economic benefits change as a result of any of the Alternatives? An economic electrical cost benefit would also accrue, in time, to the electrical energy consuming public and industry.

Indicators: Income and employment
Tax royalties

## Issues Not Analyzed In Detail

The following issues identified through the public scoping process were determined to be outside the scope of the Proposed Action, did not drive alternative selection, already decided (by laws, regulations, or Land Use Plan decisions), irrelevant to the decision, or not affected by the Proposed Action or build alternatives. Therefore, these issues were not analyzed in this EIS. Issues not analyzed in detail in this EIS are summarized below; text includes statements or concerns made by the public. The rationale or justification for not analyzing these issues in detail is presented immediately following the summation of each individual issue.

### *Geology*

The surficial geology of the Convulsion Canyon and Quitchupah Creek area would be affected by road construction mainly in areas that require blasting.

- Surface exposures of formations would be impacted by blasting and road construction, but these impacts would be confined to aesthetic ones. The nature of the canyon is one of rocky outcrops and steep, exposed slopes.

### *Landslide*

There is a mapped landslide feature along the north side of Convulsion Canyon at the intersection of the existing Acord Lakes transport road and the jeep trail.

- The landslide is presently stable and not a threat to the Acord Lakes Road. The potential for additional landslides in the Project Area was reviewed and no recognized active landslides were identified.

### *Noise*

The change in nature of a remote area to a readily accessible area with consistent haul truck traffic would be expected to increase the noise level, both in intensity of the noise and frequency of events. This basic change would potentially degrade the recreation experience of those seeking a remote type of recreation and could affect wildlife. The noise level from coal truck traffic in the town of Emery will increase.

- Overall, noise would increase above current natural background levels in the road corridor. Due to the remote and rural nature of the Project Area, noise receptors in the area are limited. Haul truck traffic would be consistent once established. Remote recreation experiences are available throughout this region of Utah; although noise could affect the area close to the haul road, the opportunity for remote recreation experiences in the region would be minimally affected. Initial road construction activity would make the area less desirable to wildlife. Once the road is established, big game in particular, as well as songbirds, would be expected to avoid the noise present in the road corridor. Depending upon need and forage availability, however, big game may utilize habitats alongside the road. Other wildlife are likely to become accustomed to the consistency of truck traffic noise once the road is complete. The same amount of coal will be trucked through the town of Emery whether or not this road is constructed; therefore the proposed project would not further impact noise levels in the town of Emery.

***Road Costs***

How do the road costs compare and what upgrades would need to be completed for the intersection with SR-10? Is the mileage saved worth the cost? The different alternatives would have different construction costs.

- The toll user would pay for road construction costs, including the intersection with SR-10. The fuel/transport savings would pay for the road within a matter of 5 to 10 years depending on alternative chosen.

***Range Resources***

**Trucking/ Cattle guards**

Trucking cattle is not a viable option due to the potential for cow and calf deaths resulting from trampling and also for the potential of cows abandoning calves.

- Trucking cattle is a commonly used method in Utah to move livestock to and from summer ranges, with negligible adverse results.
- Trucking is not necessary since designated livestock trail would be constructed and trailing would be allowed.

Cattle guards are not practical under the use of heavy coal trucks.

- Cattle guard structures are utilized on other coal transport roads and would be designed for use with heavy trucks.

***Socioeconomics***

**Unions**

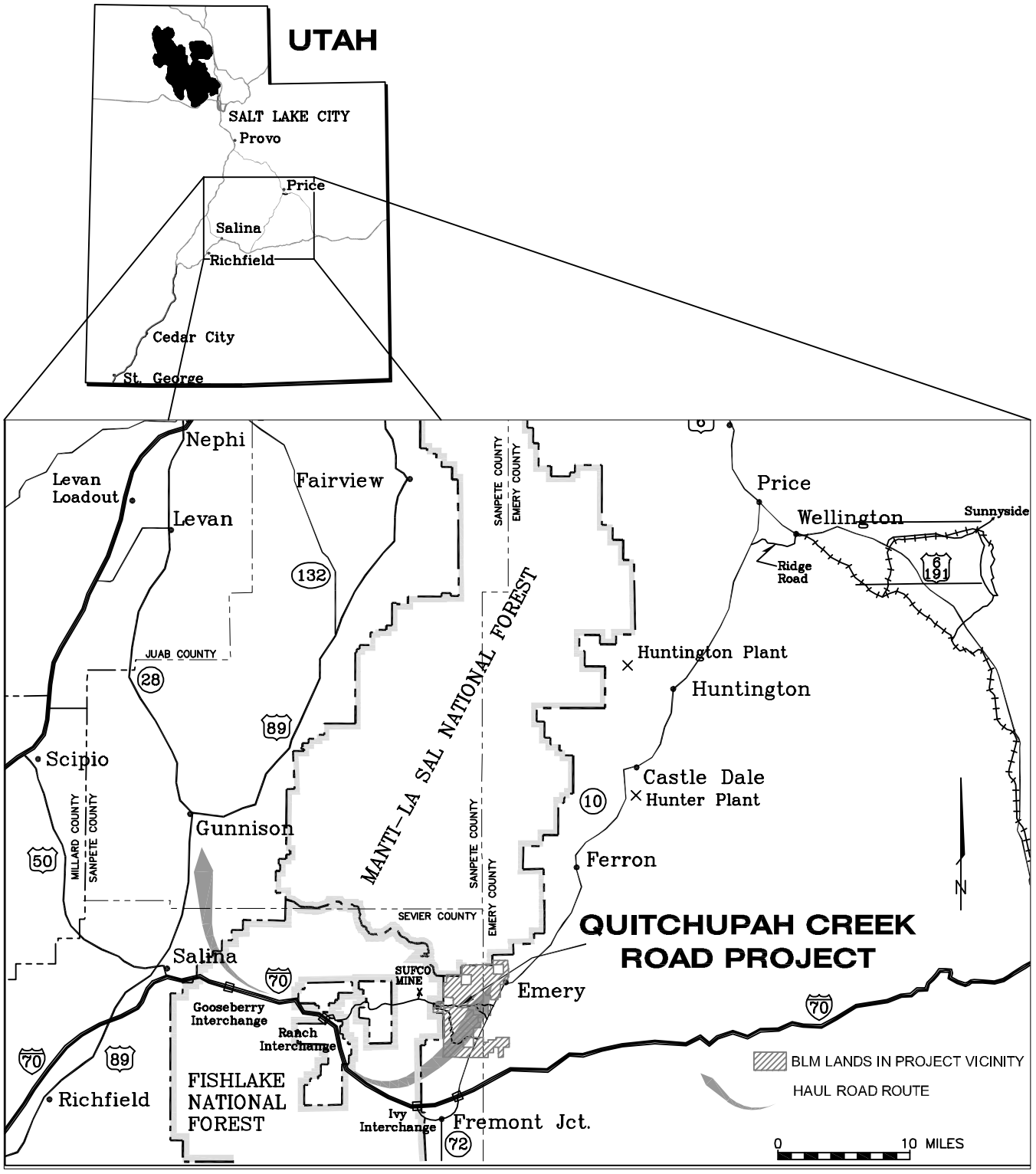
SUFCO Mine is a non-union mine. With the potential for an increased competitive position for markets east of the Plateau, there could be an impact to the union coal mines in Carbon and Emery Counties. Non-union mines could perceive preferential treatment based on this economic advantage.

- Due to closing or declining production from union mines in Carbon and Emery Counties, some coal sales have already shifted to the SUFCO Mine out of necessity and/or competitive advantage.

**Private Lands**

Some of the private landowners in the Project Area have questioned the need for a road and have not been favorable to granting a right-of-way for the road. The ranchers assert the road would interfere with their ranching operations and reduce the quality of life in the Quitchupah Creek area. The proposed road would cross 3.7 miles of private lands, mostly ranch lands adjacent to the lower creek. Five parcels of undeveloped land adjacent to SR-10 would also be affected.

- Under Alternative B (Proposed Action), a prescriptive easement for the road is in place. Under Alternatives C and D, the associated private landowners are amenable to granting a right-of-way.




# QUITCHUPAH CREEK ROAD EIS

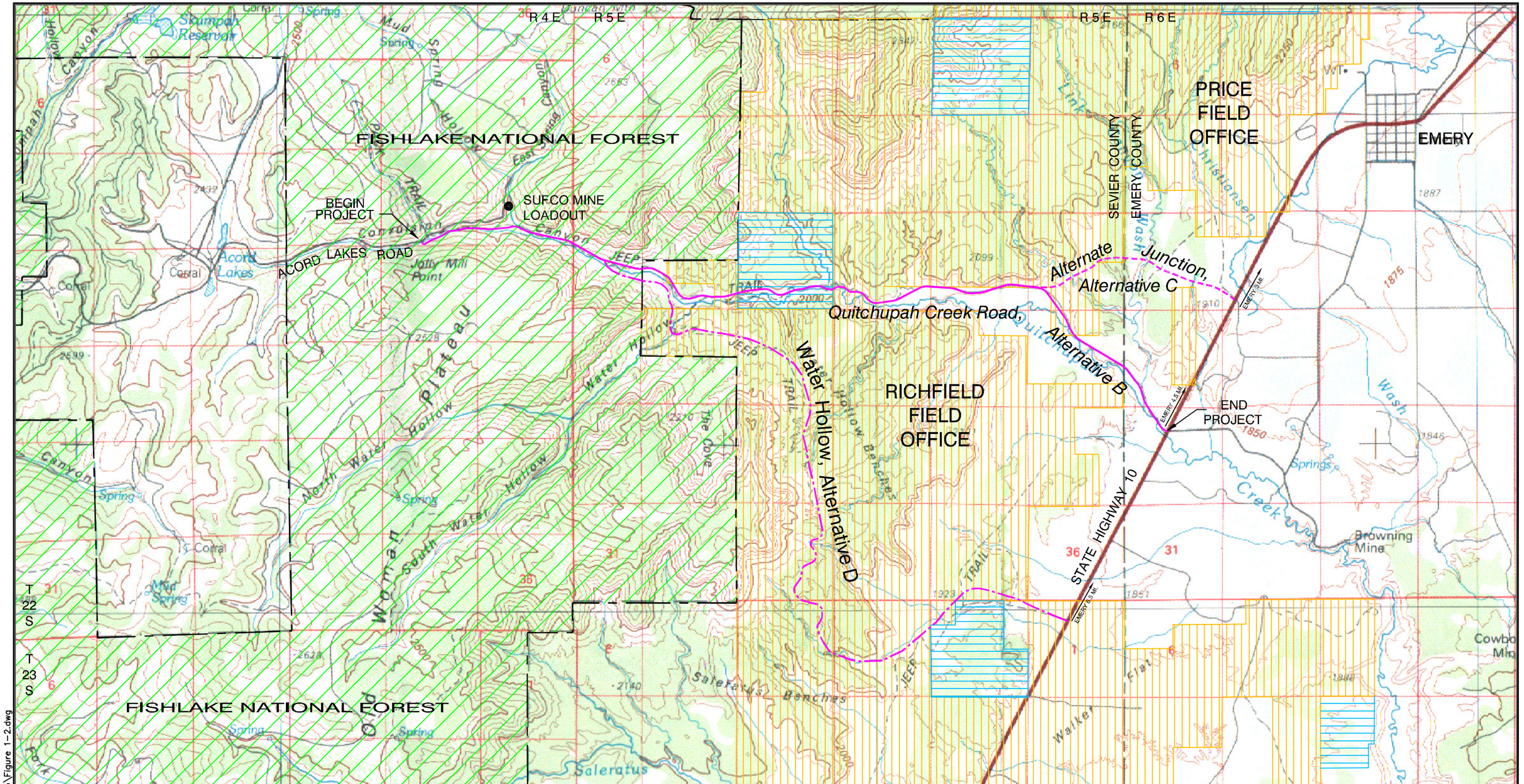
FIGURE 1–1
REGIONAL LOCATION MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE |
|---|---|---|---|
| TT | CP | | 1"=10 MI |

| DATE DRAWN | 7/29/01 |
|---|---|
| REVISION | 9/6/01 |
| | 10/6/01 |
| | 7/14/05 |

drawings\QUITCHUPAH\deis 110305\Figure1-1.dwg




EXPLANATION

- FISHLAKE NATIONAL FOREST BOUNDARY
- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D

NOTE: WITH NO ACTION, NONE OF THE ROUTES WOULD BE CONSTRUCTED.

LANDSTATUS

- FISHLAKE NATIONAL FOREST BOUNDARY
- BLM LAND
- STATE LAND
- PRIVATE LAND

N

1 0 1 MILE

# QUITCHUPAH CREEK ROAD EIS

FIGURE 1–2
PROJECT AREA AND ALTERNATIVES

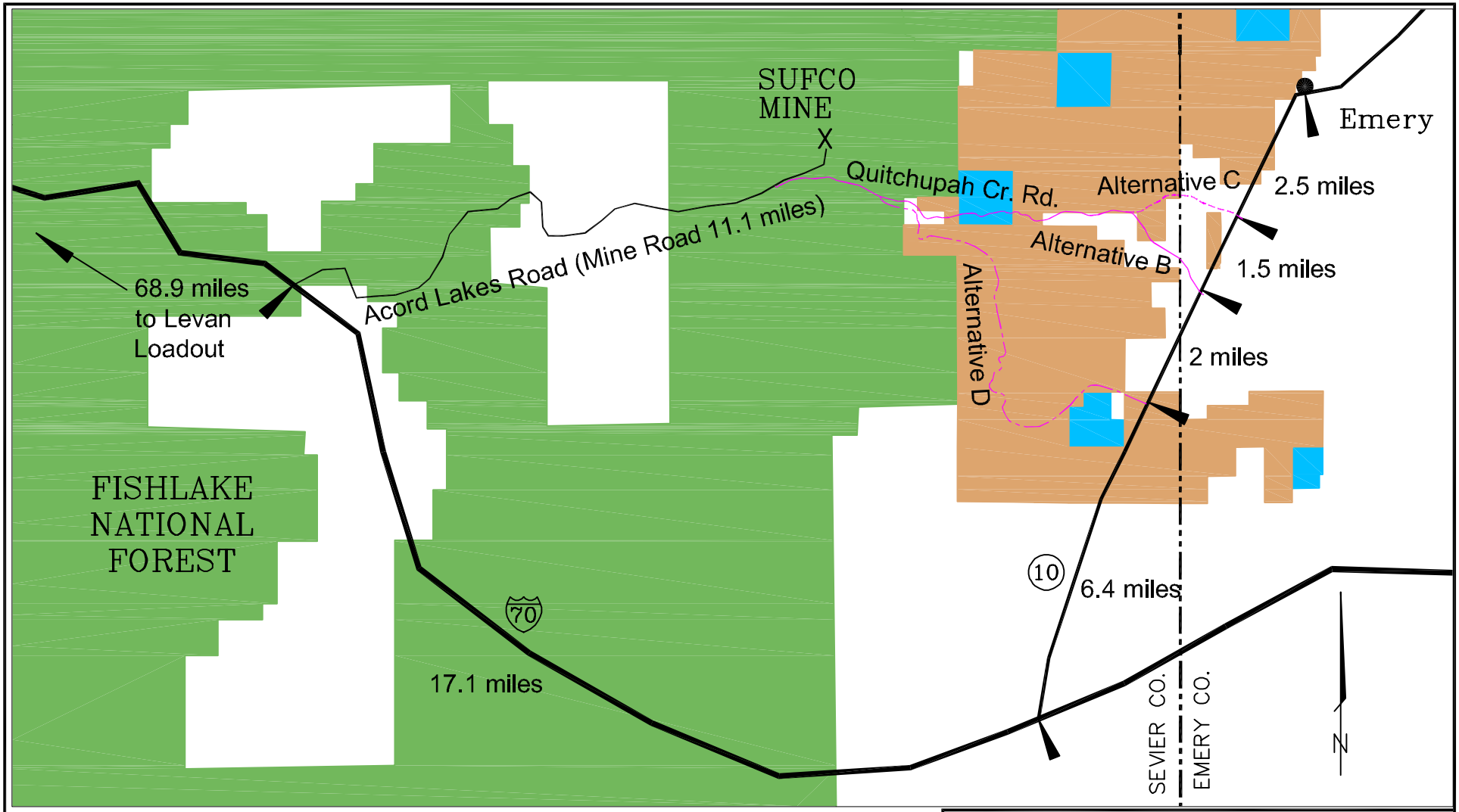
jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE |
|---|---|---|---|
| LM | CP | | 1"=1 MILE |

| REVISION | DATE DRAWN |
|---|---|
| | 8/05/02 |
| | 11/15/02 |
| | 6/13/03 |
| | 7/14/05 |

drawings\QUITCHUPAH\deis 11/03/05\Figure 1-2.dwg

drawings\QUITCHUPAH\deis 110305\Figure1-1.dwg




EXPLANATION

- FOREST SERVICE LAND
- PUBLIC LANDS
- STATE LANDS
- PRIVATE LANDS
- DISTANCE MARKER

ALTERNATIVES

- ALTERNATIVE B 8.9 MILES TO SR10
- ALTERNATIVE C 9.1 MILES TO SR10
- ALTERNATIVE D 11.25 MILES TO SR10

# QUITCHUPAH CREEK ROAD EIS

FIGURE 1-3
CURRENT ROUTE AND PROPOSED ACTION AND ALTERNATIVE ROUTES

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE |
|---|---|---|---|
| JM | CP | | NTS |

| DATE DRAWN | REVISION |
|---|---|
| 7/14/05 | |
| 11/03/05 | |

# Chapter 2

# Alternatives Including The Proposed Action

# 2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The formulation of alternatives was guided by the key focus issues; purpose and need; land use objectives of the Fishlake National Forest LRMP, the BLM San Rafael RMP, and the Forest Planning Unit Management Framework Plan; and the need to comply with Federal, State, and local laws, regulations, and policies. The potential alternatives were evaluated by the Interdisciplinary Team (IDT) to determine whether they addressed the focus issues, met the purpose and need of the project, and were technically and economically feasible.

During the alternatives development process, the IDT reviewed a reasonable range of potential alternatives to the Proposed Action. The alternatives developed encompass the complete spectrum of possible decisions that range from No Action to selection of one of three alignment Alternatives. A variety of factors were examined during the development of the alternatives for the EIS. Consideration was given to avoidance and/or minimization of effects to water (surface and groundwater), wetlands, riparian zones, vegetation, wildlife, special status species, range/livestock, cultural resources, public safety, and aesthetics. However, the sloping to steep natural terrain between the Acord Lakes Road and SR-10 limits the options available for locating roads and other surface facilities.

The following Alternatives are consistent with the Fishlake National Forest LRMP, the BLM San Rafael RMP, and the Forest Planning Unit Management Framework Plan. Four Alternatives were considered for analysis in this EIS, as shown in **Figure 1-2**, and listed as follows:

### ALTERNATIVE A - NO ACTION

A public road for the purposes of transporting coal or alternate access to the SUFCO Mine would not be built in Convulsion Canyon/Quitchupah Creek area. The existing road would remain in place and in use. The existing transport route of Acord Lakes Road to I-70 to SR-10 to power plants and railroad loadouts would continue to be utilized. Also the current land uses in the Quitchupah Creek area would continue.

### ALTERNATIVE B - QUITCHUPAH CREEK ROAD ALIGNMENT

This alignment generally follows the existing two-track road in Convulsion Canyon/Quitchupah Creek area to the maintained county road in Emery County to junction with SR-10 at the Quitchupah Creek Bridge. This alignment is approximately 8.9 miles long. The legal description is as follows:

| | |
|---|---|
| Junction Acord Lakes Road: | SW1/4 of Section 11, T.22 South, R.4 East, SLBM |
| thru: | Section 12, T.22 South, R.4 East, SLBM |
| | Sections 18, 17, 16, 15, 14, 13, 24, T.22 South, R.5 East, SLBM |
| | Section 19, T.22 South, R.6 East, SLBM |
| Junction SR-10: | NW1/4 of Section 30, T.22 South, R.6 East, SLBM |

The existing road would be supplanted by the new road for about 5 miles of its length. In areas where the new road alignment is more direct than the existing road, the unused road segments (approximately 4.3 miles of two-track road) would be fully reclaimed and no longer driveable.

### ALTERNATIVE C - ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN

This alignment follows Alternative B to a point on the western edge of Section 13 T. 22S R. 5E, then turns northeast to gain elevation the last two miles and junction with SR-10 at a favorable grade, 1.5 miles north of the Quitchupah Creek Bridge. The alternate junction allows loaded coal trucks to utilize their momentum to gain elevation and avoid the steep grade on Quitchupah Hill on SR-10. The alternate design includes additional wildlife fencing and underpasses to allow livestock and wildlife to move safely back and forth through the road corridor. The legal description is as follows:

| | |
|---|---|
| Junction Quitchupah Creek Road: | SW1/4 of Section 13, T.22 South, R.5 East, SLBM |
| thru: | Section 18, T.22 South, R.6 East, SLBM |
| Junction SR-10: | SW1/4 of Section 17, T.22 South, R.6 East, SLBM |

Under this alignment, about 4.4 miles of the existing road would be supplanted by the new road. Two-track road segments that would be reclaimed total 2.5 miles.

**ALTERNATIVE D - WATER HOLLOW ROAD ALIGNMENT**

This alignment follows the existing two track road in Convulsion Canyon, then turns southeast at a point near the center of Section 18, T. 22S R. 5E, crosses Convulsion Canyon, then crosses Water Hollow and the Water Hollow and Saleratus Benches. This alignment avoids proximity to Quitchupah Creek and the North Fork Rock Art complex, but it does involve large cuts and fills to cross Water Hollow and a few other large drainages. This road alternative would be 11.25 miles long. The legal description is as follows:

| | |
|---|---|
| Junction Quitchupah Creek Road: | SE1/4 of Section 18, T.22 South, R.5 East, SLBM |
| thru: | Sections 18, 17, 20, 21, 28 and 33, T.22 South, R.5 East, SLBM |
| | Sections 1, 2, 3, 4, T.23 South, R.5 East, SLBM |
| | Section 35, T.22 South, R.5 East, SLBM |
| Junction SR-10: | NW1/4 of Section 1, T.23 South, R.5 East, SLBM |

Except for the western end where the new road would obliterate the existing road (approximately 2.1 miles), the existing road would remain in place and in use.

### Applicant Committed Measures/Best Management Practices

Throughout the document, several terms are used to discuss ways of preventing or alleviating impacts to resources. These terms are defined below and in the glossary.

***Applicant or Agency-Committed Measures*** are steps planned or taken toward the accomplishment of a purpose that the applicant (i.e. SSD and SUFCO Mine) or agency is committed to completing, executing, fulfilling, etc.

***Best Management Practices*** (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce impacts to resources. These practices are defined by research and field testing to be the most effective and practicable methods to achieve desired resource protection.

## 2.1 Alternative A - No Action

Under this Alternative, the existing uses and environment in Quitchupah Creek and Water Hollow would continue unchanged in the foreseeable future. The historic use of the area for livestock trailing and grazing, the general solitude of the environment, recreational uses, and generally undisturbed condition of the cultural resources would continue. Likewise, current activities in the Project Area would continue; these include livestock trailing and grazing, erosion, and road/power line maintenance. Years of livestock trailing and grazing have impacted riparian and wetland soils by causing detrimental puddling and compaction disturbances. Trailing and grazing have also impacted general vegetation, and water quality (high total dissolved solids). Road erosion has also affected access into the canyon. Erosion due to road and power line construction and maintenance has also affected water quality. Emphasis on livestock grazing via intensive range management as recorded in the Fishlake National Forest LRMP is likely to continue as the primary management for Forest lands in Convulsion Canyon.

Under the No Action Alternative, the current transportation routes would continue to be utilized (**Figure 1-3**). UDOT has initiated studies to determine what is needed on SR-10 to handle the large increase in coal truck traffic from the junction with I-70 to the Hunter and Huntington power generating plants. State Route 57 from Orangeville to SR-10, which formerly was the sole route for coal transport to Hunter Power Plant, was designed and constructed to accommodate coal truck traffic from the adjacent mines to the power generating plants. SR-10, constructed 40 years ago, was not originally designed and constructed to accommodate large volumes of coal truck traffic. To accommodate this increasing coal truck traffic, the southern 20 mile section of SR-10 from I-70 to Muddy Creek would need to be rebuilt and bridges replaced. According to the Utah Department of Transportation (UDOT) online construction reports, the repaving and rehabilitation of the southern 10-mile section of SR-10 from milepost 0 (Fremont Junction, at I-70) to milepost 10 (Quitchupah Hill) (Project # STP-0010(20)0) has been completed. The replacement of Muddy Creek bridge north of Emery was 95 percent complete in October 2005 (Project # BRF-0010(27)16; UDOT 2005).

In addition, passing lanes would need to be constructed at Quitchupah Hill and Rock Creek to improve traffic flow.

According to a study (Parsons Brinkerhoff, 2001), the consequences of increased coal truck traffic (an increase from 20% trucks to 60% trucks in the AADT) on SR-10 highway conditions include severe pavement rutting, pavement cracking, increased pot-holing and patching, accelerated bridge deterioration, ride deterioration, and increased traffic congestion. The build alternatives (B,C,& D) would provide relief from this increased coal truck traffic on the lower portion of SR-10.

The No Action Alternative provides no relief for truck traffic on SR-10; the current coal transport route would continue as the future route. SR-10 is a high maintenance road due to the presence of Mancos shale-derived soils underlying the road base. UDOT/ Emery County expenditures for accelerated maintenance on this road under the No Action Alternative would continue. The emissions from the consumption of 1.4 million gallons of diesel fuel annually would continue.

## 2.2 Alternative B - Quitchupah Creek Road Alignment

Sevier County SSD has proposed to upgrade the existing road in Quitchupah Creek canyon, which connects the Acord Lakes Road in Sevier County with SR-10 in Emery County. The lands in this corridor are a combination of private, USFS, BLM, and SITLA. Under this Alternative, the round-trip coal hauling transport distance would be decreased by approximately 55.4 miles, which would also shorten the trip for mine services located in Carbon and Emery Counties and would reduce traffic on the southern portion of SR-10. The proposed Quitchupah Creek Road would be located along an existing two-track road through Quitchupah Canyon from SR-10 in Emery County to an existing mine road in Convulsion Canyon, Sevier County. The road would intersect SR-10 in the north half of Section 30, Township 22 South, Range 6 East (**Appendix A**). From SR-10, it would continue to the northwest into Sevier County, and then westward, generally following an existing trail along Quitchupah Creek, into Convulsion Canyon, to where it would connect with the Acord Lakes Road in the southwest quarter of Section 11, Township 22 South, Range 4 East.

The proposed road would be a 28-foot wide paved surface, with an operational right-of-way of 66 feet. Two pullouts for parking off the road shoulder would be provided; one at the Link Canyon channel crossing, and one at the East Springs Creek crossing. The construction corridor would vary from 50 feet to 60 feet on the flatter ground (eastern end) to an average 100 feet for the remainder of the road. The

road would be designed for a speed of 40 miles per hour, and constructed according to the standards of AASHTO, the current UDOT Standard Specifications for Road and Bridge Construction, and any additional requirements of the County. No facilities would be built in association with this alignment. The existing road would be supplanted by the new road for about 5 miles of its length. In areas where the new road alignment is more direct than the existing road, the unused road segments (approximately 4.3 miles of two-track road) would be fully reclaimed and no longer driveable. The details of the engineering design are presented in **Appendix B**.

**Lands**

The lands crossed by this proposed road include private, USFS, BLM, and SITLA (see **Figures 2-1** and **2-2**). There are several private landowners along the route, listed as follows:

Wynona P. Olsen, Trustee
Patricia Lois and George E. Olsen
Julian Bowman
James V. Olsen, Trustee
Thomas C. Bunn et al.
Castle Valley Ranches, LLC

**Table 2.2-1** describes land status, length of proposed road within each jurisdiction, and estimated disturbance.

**Table 2.2-1 Quitchupah Creek Road Alignment Land Status and Proposed Disturbance**

| Land Mgmt. | QCR Road Distance (miles) | County Jurisdiction | Road Construction Disturbance (acres) | Existing Road Disturbance (acres) | Staging Areas (acres) | Pull-Outs (acres) | Total New Surface Disturbance (acres) |
|---|---|---|---|---|---|---|---|
| USFS | 2.3 | Sevier | 24.0 | 3.3 | 5.0 | 0.3 | 26.0 |
| BLM | 1.8 | Sevier | 18.4 | 1.8 | 5.0 | 0.3 | 21.9 |
| SITLA | 1.1 | Sevier | 12.3 | 0.9 | 5.0 | 0 | 16.4 |
| Private | 3.7 | Sevier & Emery | 33.7 | 5.7 | 0 | 0 | 28.0 |
| Totals | 8.9 | | 88.4 | 11.7 | 15.0 | 0.6 | 92.3 |

**Road Corridor**

The construction corridor for the Quitchupah Creek Road would range from 50 feet to a maximum 220 feet, depending upon terrain, soil stability, and proximity to Quitchupah Creek. Approximately 11.7 acres of the construction right-of-way would be on previously disturbed ground. The total maximum new disturbance under this alternative within the road construction corridor would be 89.0 acres. Approximately 45 acres of land would be dedicated to roadway when the construction has been completed.

The Quitchupah Creek Road alignment would require expansion of the SR-10 bridge crossing over Quitchupah Creek to accommodate additional lanes for acceleration and turning.

**Staging Areas**
It is anticipated that there would be two to three staging areas associated with this project. These would be located upon USFS and BLM, and/or SITLA administered lands; each would be approximately five acres. Staging areas would be utilized for equipment storage, maintenance, and parking. The staging areas would be bladed, with erosion control provisions installed as necessary. They would be reclaimed at the end of the construction period. Potential staging areas are:

1) existing road north of station 18+00 to 22+00
2) area south of station 220+00 to 224+50
3) area north of station 386+00 to 389+00 (see **Appendix B**, Strips Maps 1,8,13)

**Borrow Material Areas**
The materials required for construction of the road include 75,000 cubic yards ($yd^3$) of granular borrow, 40,000 $yd^3$ of untreated base course, and 20,000 $yd^3$ of gravel to make asphalt. These materials would be purchased from a local gravel pit or extracted from an existing aggregate borrow source located east of SR-10.

**Pullouts**
Pullouts are proposed for each of the build alternatives for access to adjoining lands. Each would be 30 feet wide by 100 feet long unless the design is to use the existing road. Pullouts for Alternative B are proposed at the following stations:

| | |
|---|---|
| Station 12+00 to 13+00 | north side of proposed road |
| Station 60+00 to 63+50 | north side, use existing road as pullout |
| Station 121+00 to 122+00 | south side of road |
| Station 175+50 to 180+00 | south side, use existing road as pullout |
| Station 287+00 to 288+00 | south side of road |
| Station 450+00 to 451+00 | north side of road |

**SR-10 Junction**
The proposed road would junction with SR-10 at the existing intersection with the CONSOL Mine Road, an Emery County road 4.5 miles south of the Town of Emery. Because the proposed road and the CONSOL Mine Road would both carry coal truck traffic, both right and left turn lanes would be required for each road. Also, due to the uphill grade for northbound traffic, an extended acceleration and climbing lane of 2,300 feet would be required for the coal truck traffic (**Figure 2-3**). Thus, there would be 4 lanes south of the intersection and 5 lanes north of the intersection. The existing bridge over Quitchupah Creek would need to be widened 8 feet to the west and 32 feet to the east, almost doubling its current width.

An access permit would be required from UDOT for the junction with SR-10. The disturbance for construction of the intersections and additional lanes would occur within the existing UDOT right-of-way or acquired right-of-way.

**Construction Procedures**
It is anticipated that the road would be built in 10 months using a construction spread that would employ an estimated peak work force of approximately 30 to 50 persons.

The design and construction of the road would be in general conformance with applicable industry standards as determined through engineering design.

The construction sequence includes preparing the right-of-way and roadbed, construction of the road, and restoring the staging areas.

**Preparation of the Right-of-Way and Roadbed**
Preparation of the construction corridor would involve topographic survey of the right-of way to establish final roadbed grade and staking the centerline of travel. Blading and removing vegetation over the entire length of the right-of-way and at staging areas would occur within the staked limits of the right-of-way. A maximum of 92.3 acres of land would be affected. Spoil and cut vegetation would be temporarily stockpiled along the right-of-way edges. Soil material would be separated by means of windrowing or sidecasting. A minimum of six inches of the upper soil material (topsoil) would be stored along the edge of the bladed right-of-way.

Upon completion of roadbed clearing, crews would begin construction of the roadway subgrade. Road base would be placed along the established roadway and graded to plan. Graders, scrapers, and dozers would be utilized to obtain the necessary grade and alignment. Once the prescribed grade and centerline of travel are constructed to plan, pavement would be placed.

The contractor would not disturb areas outside the staked right-of-way without prior written permission from the appropriate land managing agency or individual owner.

During rehabilitation, this topsoil material would be spread evenly over the disturbed areas.

**Soil Stabilization**
Upon approval to build the proposed road or alternative, appropriate geotechnical investigations would be performed to determine soil characteristics throughout the roadway. California Bearing Ratio (CBR) values would be determined and used to complete the pavement designs according to methods approved and specified by AASHTO.

Calculated design for the road indicates that no more than a 12-inch thick layer of granular borrow will be necessary below the untreated base course. Calculation of CBR from 16 soil samples collected on the alignments supports the 12-inch granular borrow layer (see **Appendix B** for details). However, some of the soils contain a high percentage of expandable clays that can deform and break up road base and asphalt. UDOT has had extensive experience with these expandable soils under some of the major roads within the area, and recommends up to three feet of granular fill and base on top of them. The use of three feet or more of granular borrow would be an option for sites with particular soil problems. These clayey soils are also strongly saline, so they should not be used as fill or for fill slopes.

If it were determined that unusual subsurface formations or soft soils existed, additional features would be added to the design of the roadway cross-section. These additional features could include: geotextile and/or geogrid between the native soil and the extra depth of placed granular borrow; geotextile and/or geogrid within the placed granular borrow; and/or other soil improvement methods such as compaction grouting, deep dynamic compaction, and lime and cement stabilization methods.

If it is determined that the soils in question are inadequate for subgrade material, the soft soils would be removed and replaced with granular borrow materials that meet the required strength, in conjunction with the use of the methods mentioned above.

In any case, for soil stabilization as well as all other aspects of final road design, USFS and BLM would have final approval on the specific techniques and materials used.

**Construction of the Road**
After crews have prepared the road subgrade, the contractor would begin hauling, placing, and compacting the granular borrow to an estimated depth of 8 to 12 inches. This is the first phase of the surfacing process. The second phase would involve placement and compaction of an eight-inch lift of untreated base course. **Figures 2-4** and **2-5** show typical cross sections for road construction. **Figure 2-4** is a typical section for the road on suitable soils and **Figure 2-5** is a typical section for road construction on expansive soils.

The completed road would have a 28-foot paved surface width. The road would consist of 6 to 8 inches of untreated base course overlaid by 5-inches of asphalt concrete.

Approximately 400,000 $yd^3$ of roadway excavation, 41,000 tons of non-rutting asphalt concrete and asphalt mix, 80,000 tons of untreated base course, and 75,000 $yd^3$ of granular borrow are proposed for the road construction.

**Public Access & Safety**
During construction of the road, signs would be placed on SR-10 at the Quitchupah Creek Road junction as well as on the Acord Lakes Road, notifying the public of construction activities. The existing two-track road would be available for partial access into the Quitchupah drainage. Provisions would be made for hunter access during big game hunting season, depending upon the status of road construction at that time.

**Blasting**
The proximity of the Quitchupah Creek Road alignment to rock canyon walls in some areas suggests the need for blasting to remove rock. The areas that may require blasting include:

Station 25+00 to 50+00
Station 80+00 to 81+00
Station 108+00 to 111+00
Station 118+00 to 122+00
Station 156+00 to 174+00
Station 233+00 to 237+00
Station 262+75 to 263+25
Station 275+00 to 283+00

**Appendix B** contains maps showing the approximate locations of these blast sites.

The contractor must exercise great care in blasting and would be responsible for and assume all liability connected with the blasting and use of explosives. The contractor would be liable for all damage on adjacent property, all injuries, lawsuits, complaints, and any other actual or alleged damages. Blasting would be conducted in accordance with the Labor Commission, Occupational Safety and Health, Hazardous Material, R614-4-18 - Use of Explosives and Blasting Agents. Provision R614-4-18 (A)(3) states: "When blasting is done in congested areas or in close proximity to a structure, or any other installation that may be damaged, the blast shall be covered before firing with a mat constructed so that it is capable of preventing fragments from being thrown." The contractor would observe all safety rules for the handling of explosives, and in no case would blasting caps be stored near the explosives. No blasting would be done outside regular working hours except with special approval. All explosives would be stored in compliance with laws and regulations and all storage places would be properly marked. The

contractor would comply with Utah Occupational Safety and Health (UOSH) construction standards, chapter "U" rules and regulations. The contractor would provide a qualified explosives expert to act as advisor and consultant during drilling and blasting operations. Blasted material would be used for riprap if it meets riprap specifications, otherwise it would be used as fill material.

**Erosion and Sediment Control**

Erosion due to construction activities would be controlled as necessary by: using energy dissipation at culverts; placing straw wattles, rolled coir logs, or similar structures on steep slopes with fine grained soils; placing or leaving large rock; reseeding fill and cut slopes; and other measures as defined in **Appendix B – BMPs.** In regard to sediment control, silt fences, water bars, or other sediment control structures, as defined in **Appendix B - BMPs**, would be utilized to prevent sediment loading during streambank manipulation and road construction. Some of these controls (both erosion-related and sediment-related) would be left in place until full stabilization of the roadway and slopes have been reached. A Storm Water Pollution Prevention Plan (SWPPP) would be developed prior to construction, as one of the terms of the required storm water discharge permit that would be required by Utah Division of Water Quality (DWQ). It would detail how and when each control device would be utilized. The SWPPP would be developed to ensure that the construction project complies with all permit requirements including the 401 Water Quality Certification Application conditions. **Appendix B** contains the BMPs that would be utilized during and after construction.

**Dust Control**

Water for dust control and compaction during construction of the lower portions of the road would be solicited from a local irrigation company, depending upon the time of year of construction. In the event no water is available during irrigation season, water would be requested from Emery or other sources and trucked to the site. At the upper end of the road, water would be obtained from the mine pump station by Sta. 65+00.

**Stream Crossings and Culverts**

The road alignment for Alternative B would require a total of 43 culverted crossings. **Figure 2-6** shows the locations of these crossings. This includes 18 primary crossings and 25 secondary crossings. Primary crossings are designated at perennial, intermittent, or ephemeral watercourses that have large drainage areas and/or defined channels. Secondary crossings are designated at smaller ephemeral watercourses that drain smaller watersheds and/or have little or no channel definition. All of the primary and secondary culvert crossings would be designed to pass the 100-year flow, as calculated by Utah Department of Transportation methodology (UDOT, 2002). **Table 2.2-2** shows the 18 primary culvert locations, design flows and culvert diameters.

Depending upon the season of construction, up to six of these crossings would be expected to be wet. BMPs that would be implemented during culvert design, placement, and maintenance are described in **Appendix B**.

The existing bridge on SR-10 would require widening 8 feet to the west and 32 feet to the east, almost doubling its size. This construction would be under the direction of UDOT and to UDOT and AASHTO standards.

In addition to the crossing culverts, numerous borrow ditch relief culverts would be used to direct and control road and upgradient runoff. They would be spaced at 500-foot intervals or less, depending upon road slope and proximity to stream channels. BMPs that apply to borrow ditch relief and other road drainage issues are contained in **Appendix B**.

**Table 2.2-2 Primary Culvert Crossing Information - Alternative B**

| Station | Design Flow (cubic feet per second) | Culvert Diameter (inches) RCMP unless noted |
|---|---|---|
| 11+00 | 123 | 60 |
| 18+00 | 173 | 72 |
| 66+00 | 234 | 84 |
| 94+00 | 252 | 84 |
| 186+50 | 117 | 96 |
| 190+50 | 39 | 42 |
| 201+00 | 123 | 60 |
| 203+50 | 26 | 36 |
| 213+50 | 108 | 60 |
| 228+50 | 1702 | 3 (108)* |
| 232+50 | 1702 | 3 (108)* |
| 250+00 | 1144 | 2 (108)* |
| 251+50 | 2800 | 300 by 120 (alum. box)* |
| 256+50 | 2800 | 300 by 120 (alum. box)* |
| 268+00 | 282 | 84 |
| 300+00 | 156 | 60 |
| 323+50 | 117 | 60 |
| 451+00 | 586 | 120 |

* These crossings would provide fish passage.
Note: At crossings where fish passage is required, specialized culverts may be used, and diameter/type may vary from what is given above. However, in all cases, capacity will be capable of passing the 100-year flow at a minimum.

**Stream Re-Alignment**

Stream realignment would be required in upper Convulsion Canyon, lower East Spring Canyon, and in Quitchupah Creek at the Rock Art site. The stream realignment process requires a State of Utah Stream Alteration Permit. For this project, because an individual COE permit would also be needed for the wetland fill, the COE has asked to handle all stream realignment and crossing permits under the single COE 404 permit, rather than using the joint state/federal GP40 Permit that is handled under the Stream Alteration rules. The permit would set conditions for hydraulic design of each realigned section to maintain the integrity of the creek both upstream and downstream. Further, **Appendix B** provides BMPs that would be used in the design and construction of these realigned sections.

In upper Convulsion Canyon, the channel would be moved north away from the road fill toe between stations 13+00 and 15+00, for a realignment distance of 200 feet. Just downstream from that location, the channel would be moved south between the new road fill and the steep canyon slope, between Stations 19+00 and 45+00. Based upon this road stationing, channel realignment would be required for approximately 2,600 feet.

In lower East Spring Canyon, the proposed road, between stations 65+00 and 75+00, would interfere with about 1,100 feet of the existing East Spring Canyon channel. A culvert about 170 feet long would replace the existing crossing, and from the mouth of the culvert downstream for approximately 900 feet, the channel would be realigned to the south of this existing location. Depending upon the appropriate morphologic sinuosity of the final designed replacement channel, total length of the realignment, not including culvert, would be about 900 feet.

In Quitchupah Creek at the Rock Art complex, an existing dry meander bend would need to be shortened in order to accommodate the road fill west of North Fork. This would occur between Station 249+00 and 250+00, or 100 feet of roadway. In total, a maximum of 350 feet of channel would require realignment (based upon road stationing, not including any meandering of lost or replaced channel).

In Convulsion Canyon, the realigned segments would be straightened to a grade of approximately 9 percent. They would have a narrower, more uniform channel bottom than the existing channel, and would likely be riprapped and contain grade control to maintain stability. Transitional treatments would be done to insure that, at the downstream end of the realigned reach, velocities and flow area are returned to their original conditions, as described in **Appendix B**.

At approximately 249+00, a short channel realignment in Quitchupah Creek would be required. About 130 feet of meander would be filled, and a maximum of about 350 feet of stream would be placed back in its meander (it was recently cut-off during a flow event). An MSE (mechanically stabilized earth) wall, and other protective measures would be specified in the final design. The diversion of 130 feet of the stream from the cutoff back into the meander would restore 350 feet of the stream channel and decrease the grade from 7.6 percent to 2.3 percent (Strip Map 9).

For the East Spring Canyon realignment, a more naturally functioning channel would be designed, as described in the applicant-committed environmental protection measures later in this Chapter.

**Construction Equipment**
The following equipment would be utilized during various phases of construction:

- Road grader
- Rubber tired loader
- Conventional scrapers
- Hydraulic excavators (track or wheel)
- Rear dump trucks
- Belly dump trailers
- Asphalt paving machines
- Water truck for dust control
- Steel drum static compactors
- Sheeps foot compactors
- Hand held vibratory plate compactors
- Gravel crushing facility
- Track dozers
- Construction office trailer

**Hazardous Materials**
The contractor for Sevier County SSD would manage all hazardous materials (including hazardous chemicals, substances, and wastes) in full accordance with all applicable Federal, State, and local regulations. Regulated hazardous materials would be managed in an appropriate manner that protects workers and the public, and prevents accidental releases to the environment. In the event that any such materials were to be released to the environment in excess of the reportable quantities defined under the relevant Federal or State regulations, the required notifications would be made, and required reports would be completed and submitted to the appropriate agencies. In such an event, the USFS and BLM would be provided with copies of any such reports, along with the designated recipient agencies.

**Reclamation**
Reclamation would consist of recontouring the disturbed areas to blend into surrounding terrain, or as requested by the agencies or landowners. Crews would reseed the staging and borrow areas using seed mixtures as directed by the appropriate land managing agency. Appropriate measures would be taken as necessary to prevent erosion, including the use of water bars (See **Appendix B - BMPs**). Reclamation would be conducted to agency standards and would include monitoring and maintenance to agency satisfaction.

Reclamation would be conducted upon completion of the road (or as specified by the land managing agency), after seedbed preparation, while the growth medium is still comparatively soft and loose. All disturbed areas along the road right-of-way would be reseeded with certified noxious-weed free seed mixtures specified in **Table 2.2-3**. The areas would be drill seeded. In areas where the seed is hand broadcast, the seeding rates listed in **Table 2.2-3** would be doubled. The use of fertilizer is not anticipated at this time. However, a tackifier would be used with the seeding and mulching in order to decrease the potential for erosion and give the seed base a stable environment to grow. The erodible soils on the west end of the alternate route may require the use of erosion matting to protect the soil surface and ensure seed germination on the reclaimed soils in this area.

The existing road and two-track trail not included in the road construction area would be reclaimed to stabilize old road surfaces and reduce erosion and sedimentation. A few small sections may not be reclaimed due to rockiness or very steep slopes around headcuts or to maintain access to other roads. The stabilization of the adjoining proposed road corridor due to reclamation and drainage control would reduce the discharge of sediments onto the reclaimed existing road. The few small unreclaimed sections would be expected to slowly revegetate due to stabilization of adjoining reclaimed road.

No special efforts would be expended on the existing fords on Quitchupah Creek, as they are currently stable and would revegetate slowly when relieved of traffic.

**Table 2.2-3 Site-Specific Seed Mixtures for Quitchupah Creek Road**

| Agency | Common Name | Application Rate (lbs./acre PLS) |
|---|---|---|
| USFS/ BLM | Western wheatgrass | 2 |
| | Indian ricegrass | 2 |
| | Galleta grass | 2 |
| | Desert Globemallow | 2 |
| | Magnar Great Basin wildrye | 2 |
| | Needle and Thread grass | 2 |
| | Appar Lewis flax | 3 |
| | Delar small burnet | 3 |
| | Shadscale | 2 |
| | Total | 20 |

[1] PLS = Pure live seed

The reclamation procedures for the old road segments outside the right-of-way would include:

- ripping the old road surface to relieve compaction,
- removing culverts and regrading road to natural grades and drainage,
- installing water bars per agency specifications,
- seeding to establish vegetation,
- mulching/armoring with coarse rock to maximize moisture retention and protect reclaimed surfaces,
- placement of barriers to prevent traffic on reclaimed road surface,
- installing electric fence to exclude livestock from seedings in areas where livestock will roam freely, and
- monitoring and maintenance for at least three years or until bond release.

For reseeding of low elevation saline soils, a more drought and saline tolerant seed mix would be utilized (**Table 2.2-4**).

**Table 2.2-4 Seed Mixture for Low Elevation Saline Soils Quitchupah Creek Road***

| Agency | Common Name | Application Rate (PLS Pounds per Acre)[1] |
|---|---|---|
| BLM | Alkali sacaton | 1 |
| | Blue grama - Alma | 3 |
| | Galleta grass | 3 |
| | Gooseberry globemallow | 3 |
| | Castle Valley saltbush | 3 |
| | Kochia, prostrate | 2 |
| | Total | 15 |

*BLM Mixture [1] PLS = Pure live seed

**Quitchupah Creek Road Use**

Coal trucks servicing the SUFCO Mine would utilize the proposed road 5 days per week, 24 hours per day, 250 days per year. The rate of use would be dependent upon the amount of coal shipped to eastern markets. In addition, there would be traffic related to employee commutes, mine services, and general or recreational travel.

The coal transport trucks currently in use on the Acord Lakes Road consist of a dual trailer with a loaded weight of 43 tons. These trucks would also be utilized on the Quitchupah Creek Road.

**Operation and Maintenance**

The proposed road would be maintained primarily by Sevier County SSD, who would be responsible for scheduling of maintenance and repairs. Sevier County SSD would also be responsible for monitoring storm event or runoff damage. The current road maintenance agreement between Sevier and Emery Counties for the easternmost 1.5 miles of Quitchupah Creek Road would be revised. Maintenance on the Emery County portion of the road could be performed by either county, by agreement.

## Applicant-Committed Environmental Protection Measures for Alternative B Quitchupah Creek

**Wetlands and Waters of the U.S.**

The U.S. Army Corps of Engineers (COE) under authority of Section 404 of the Clean Water Act as amended and Executive Order 11990 requires that all impacts to jurisdictional wetlands be mitigated. The b(1) guidelines provide a regular process for determining if the permit to be issued for filling wetlands and the accompanying mitigation plan is in the best interest of the Nation's wetlands. The b(1) guidelines offer three tiered steps: 1) to avoid impacts to wetlands, 2) if avoidance is not possible then minimize impacts, and 3) if avoidance and minimization of impacts is not possible then mitigate impacts.

There are five jurisdictional wetlands in the immediate vicinity of the proposed road; one 0.07-acres wetland at Station 44+00 and one 0.26-acre wetland at Station 67+00 in East Spring Canyon (**Appendix B**, Strip Maps 2,8) would be impacted. The COE has indicated that it would require a mitigation ratio of 3:1 on the acreage in the same watershed, and the conceptual mitigation plan more than meets that. The potential mitigation sites within the Quitchupah Creek watershed are somewhat limited mainly due to the dynamics of the channels, which either makes it difficult to divert sufficient water to establish a wetland, or thwarts efforts to permanently establish a wetland basin or area because of their instability.

In addition to the wetland near East Spring Creek, the creek also has a hydric fringe in the flat bottom of the channel. The proposed route would cover the stream for approximately 1,140 feet at three locations. To compensate for the combined loss of approximately 0.33 acres of wetlands filled at Stations 44+00 and 67+00, three measures would be designed and installed.

1. The existing wetland at Station 48+00 is located at the head of the perennial stream in Convulsion Canyon but downstream of the realigned ephemeral channel in the upper canyon. The source of water for the wetland is subsurface flows surfacing in the channel at Station 41+00 and a spring at the foot of a large rock adjacent to the existing two-track road. Headcutting has begun where the wetland discharges into the stream channel. The installation of a structure to elevate the discharge point four to five feet above the incised stream would enlarge the wetlands capacity by approximately 1,000 $yds^3$, and a hardened discharge point would stop the headcutting action. The enlarged capacity of the wetlands would allow for retention of the sediments generated upstream by realignment of the ephemeral channel. The enlarged wetlands would cover approximately 0.33 acres (See Strip Map 2 in **Appendix B**).

2. A potential wetland site exists at Station 62+50 where the stream coming out of Convulsion Canyon has created a willow community on a bench with a 2 percent gradient. An in-line wetland system would be created at this location by allowing streamflow to fill behind several shallow dikes constructed across the channel/floodplain area. Upstream of each dike, excavated areas would be dug to increase saturated areas. The resulting ponds and saturated areas would create a diversified wetland complex, ranging from flowing water, ponded open water, and saturated soils. The dikes would be designed with spill points to discharge excess water. The combined wetland acreage to be created would be 1.2 acres. With a combined capacity of 2,000 $yds^3$ , the diked areas would also serve to retain sediments. They would use approximately 6 percent of the average annual flow of Convulsion Canyon. See Strip Map 2 in **Appendix B**.

Items 1 (0.33 acres) and 2 (1.2 acres) above would result in a total of 1.53 acres of wetlands that would be enhanced or increased as a result of mitigation. Subtracting the 0.31 acres of poor quality wetlands already present at station 48+00 gives a total of new wetland creation of 1.22 acres. Given the loss of 0.33 acres of wetlands due to filling at Stations 44+00 and 67+00, the proposed mitigation would exceed the Corps' minimum 3:1 replacement ratio. Final detailed wetland mitigation designs must be approved by the COE. The above conceptual plans have been discussed with the current COE representative assigned to this project, who has agreed in concept with the mitigation strategy. However, specific approval would not come until the formal application process is undertaken.

3. The East Spring Canyon stream would be brought under the proposed road through a 170-foot long culvert at Station 65+50. From the mouth of the culvert downstream for approximately 900 feet, the channel would be newly constructed and would parallel the road fill to rejoin the existing stream channel upstream of the juncture with Convulsion Canyon. Channel designs would be based upon BMPs given in **Appendix B**. The resultant constructed channel would emulate the existing channel in dimensions, cross-section, and gradient so the flows, hydric fringe, wetlands, and riparian zone would replace that covered with road fill. The placement of check dams, deflectors, and riprap would help stabilize the new channel as it adjusts to the flows. Salvage of riparian vegetation (such as cut willow, sedge clumps, etc.) from the abandoned channel would be used where practical to boost vegetative success along the new channel. The channel would not be as deep as the incised channel; it would be designed to contain bankfull flows, with overbank areas accommodating larger flood events. See Strip Map 2 in **Appendix B**.

**Raptor Protection**

The haul route would be patrolled daily, during daylight hours, to pick up and dispose of all animal carcasses (wild and domestic, large and small) in order to keep the road surface clear. This would reduce scavenging on the road surface by raptors and vultures. The concern is that scavengers feeding on larger carcasses that aren't readily removed from the road would be subject to coal truck-wildlife collisions. Scavengers present on the road while feeding could cause unnecessary mortality among the protected raptors. The Sevier County Special Services District would be responsible for removing carcasses to a specified disposal area in accordance with the regulations of the State Board of Health. This would continue for the duration of the life of the mine. The SSD or the SSD's contractor would secure and maintain any necessary license or permits required by State or local authorities to perform this service.

**Water**

As a result of coal loading, coal trucks have coal dust and debris on the exterior of the truck that is blown off as the truck travels; this dust and debris becomes part of sediments along the roadbed. Since coal trucks traveling in Convulsion Canyon would be in close proximity to the stream, fugitive coal dust from the trucks would readily enter the stream system as airborne or waterborne sediments. To prevent this, the coal trucks loading at the SUFCO Mine would be cleaned after loading and prior to entering the public road system to remove fugitive coal particles from the exterior of the truck and trailer.

**Livestock**

*Cattle Trail*

In order to accommodate cattle movement along the road corridor, a fenced cattle trail would be constructed within the road right-of-way on Forest lands, on the north side of the alignment, between the underpass at Broad Hollow and Station 60+00, approximately 1½ miles in length. The fenced trail would continue in intermittent sections below this Station (See **Appendix B** – Strip Maps) in areas where terrain restricts movement of cattle outside the right of way. The trail would be 15 to 20 feet wide, and in some places narrowed to 10 feet wide. The trail width would be cleared of vegetation during right-of-way preparation; it would be seeded once road construction is completed. Access to the trail would be gated on either end; cattle would be trailed along the road to the fenced cattle trail entrance in the spring, and cattle would gather at Broad Hollow to be let back on the trail in September. At Station 60+00, the continuous fenced trail would end, but cattle would continue to trail down outside the fenced road right-of-way and into the intermittent fenced sections of cattle trail down to the holding facility at the Forest boundary. Holding facilities would be constructed and maintained by the SSD in Broad Hollow and at the east boundary of the Forest to hold cattle that drift prior to the opening of the cattle trail gate (See Strip Maps 1 & 2 in **Appendix B**). Water would be provided at the holding facilities by the SUFCO Mine.

*Riparian Protection*

Riparian fencing along Quitchupah Creek would be installed and maintained by the applicant on public lands (BLM, FS, SITLA) adjacent to the road. This includes about 2.4 miles on Fishlake National Forest lands, about 1.2 miles on State lands, and about 1.1 miles on BLM lands contiguous to the State parcel, for a total of about 4.7 miles of Quitchupah Creek that would be fenced. The riparian fencing is expected to be 3-wire 42" standard wildlife fence (See **Appendix B**). Wildlife friendly crossings would be provided on each side of the stream at locations correlated to migration corridors and/or wildlife trails. These crossings would be lodgepole, approximately 33 feet wide, and the same height as the fencing. Fence design, installation, and maintenance would be according to agency specification. Riparian fencing would exclude cattle from the stream except at designated watering areas.

**Rock Art**
Because the rock art panels are very visible from the existing two-track, they have become well known to locals and rock art associations. The panels include a mixture of Archaic and Fremont styles, very unique for this part of Utah. The main panels are located on State lands administered by SITLA, but other panels are located on adjacent public lands.

Currently the rock art panels are accessible via the Emery County maintained road and the two-track that extends past the site. Because the previously proposed alignment for Alternatives B&C was in close proximity, within 60 feet of the rock art complex at North Fork, a realignment was designed.

The realignment of the proposed road cuts off two-track access to the site and provides the opportunity to limit or regulate public access to the rock art. If the proposed road is constructed, the two-track could be reclaimed and removed from service (See **Appendix B**, Strip Maps 9&10). A gate would be placed along this portion of the fence in order to facilitate cattle grazing on the state land.

The road realignment is designed to begin at station 246+00 and swing south to cross the North Fork approximately 220 feet downstream of the proposed crossing, then proceed east 200 feet to cross Quitchupah Creek and stay south along the slope. The realignment would then proceed northeast to cross the creek on a box culvert and then align to join the proposed route at station 263+00. This realignment is about 1,800 feet long compared to the original proposed alignment of 1,600 feet between stations.

An existing dry meander bend in Quitchupah Creek just west of North Fork would need to be shortened in order to accommodate the road fill. This would occur between Station 249+00 and 250+00, or 100 feet of roadway. At this location, the shortening of the dry meander would be required (from 500 feet currently to 350 feet). The diverting of the stream from an existing cut-off of the meander would actually restore 350 feet of dry channel negating any loss of gradient.

The realigned road would be 300 feet away from the rock art panels and across Quitchupah Creek. This would serve to restrict access to the panels by not providing a convenient stopping place in the close vicinity. The existing two-track could be reclaimed/barricaded (i.e. with strategically placed boulders or other natural material) in this area so it could not be used to directly access the site.

The realignment would also avoid the untested cultural sites near the rock art panels and would cross fluvial affected terrain. There are no eligible sites within the realignment corridor.

## Agency-Committed Environmental Protection Measures for Alternative B

The riparian zones of Quitchupah Creek and Convulsion Canyon have been degraded by livestock grazing within the stream bottoms over the years. To alleviate this condition and restore the riparian zones, livestock grazing would be eliminated on approximately 4.7 miles of stream through a combination of grazing permit changes, fencing along the proposed road, and cross-fencing where necessary. The actual fencing would be completed under an applicant-committed measure as described above; the permit actions related to this measure would be handled by the appropriate agencies. Fenced watering points would be provided where underpasses allow livestock to pass under the proposed road and access the stream. The construction of the proposed road is the primary catalyst for the changing management of grazing within the riparian zone.

Specifically, on Forest lands in Convulsion Canyon, the livestock would trail on the fenced livestock trail to and from summer pasture in the Quitchupah Allotment, and would no longer have access to the riparian zone or the mitigation wetlands and stream realignment. The spring trailing would begin in the private

lands at the east boundary of the Forest lands. The fall trailing would begin at the holding facility adjacent to Acord Lakes Road.

Per 43 CFR 4130-2(f), other terms would be incorporated into the grazing permit to cease grazing in the riparian zones along the stream. Five AUMs of forage would be lost along the stream corridor by this action. A combination of road fences, fenced livestock trail, and cross-fencing would restrict livestock access to the stream corridor.

On state lands, a condition of the rights-of-way would restrict livestock grazing in the riparian zone to specific fenced watering points.

The restoration of the riparian zones would improve wildlife and aquatic habitats, reduce sediment discharge to the stream, improve aesthetics, and stabilize the stream channel.

## 2.3 Alternative C - Alternate Junction with SR-10 and Alternate Design

This alternate route would diverge from the proposed route in the southwest quarter of Section 13, Township 22 South, Range 5 East and proceed east across Section 18, Township 22 South, Range 6 East to the junction with SR-10 in the southwest corner of Section 17, Township 22 South, Range 6 East (**Appendix A**). This route would be 0.2 miles longer than Alternative B but it would bypass the grade on SR-10 that now slows loaded coal trucks and potentially slows all northbound traffic on SR-10. The grade for this Alternative is 0.6 percent for loaded coal trucks. The loaded trucks would junction with SR-10 at a point 270 feet higher than the Alternative B junction where the grade for northbound traffic is 0.07 percent. The Alternative C route would have less elevation change between the Mine and SR-10 and allow loaded coal trucks to utilize their momentum gained while descending Quitchupah Creek Road to ascend the 0.6 percent grade. The route would cross lower Link Canyon channel, as does the Proposed Road route. The total acreage impacted for Alternative C would be 96.3 acres.

The Alternate Design would incorporate additional features to the proposed Quitchupah Creek Road to facilitate livestock movements within allotments, and also facilitate wildlife movements to and from the winter range. The wildlife/livestock facilities would include fencing of the road to keep the livestock off the roadway during the grazing season. Approximately 16.3 miles of fence would be installed under this Alternative design. It is also proposed that five underpasses approximately 20 feet wide, 70 feet long, and 8 feet high would be incorporated into this build Alternative to facilitate wildlife/livestock access to both sides of the fenced road for grazing purposes. The underpasses would also provide access to Quitchupah Creek, the only watering source in the allotments. One additional underpass would be constructed under the existing Acord Lakes Road, adjacent to the intersection with the proposed Quitchupah Creek Road, to allow wildlife/livestock to cross under during the spring and fall trailing.

Under this alignment, about 4.4 miles of the existing road would be supplanted by the new road. Two-track road segments that would be reclaimed total 2.5 miles.

**Lands**
The lands crossed by this Alternative include private, public, and SITLA. Public lands include those managed by the USFS, Fishlake National Forest, and the BLM, Richfield Field Office (**Figures 2-1** and **2-2**). There are two private landowners along the route, listed as follows:

Castle Valley Ranches, LLC
Kenneth Lee and Earlene R. Christiansen

**Table 2.3-1** describes land status, length of Alternative C within each jurisdiction, and estimated disturbance.

**Table 2.3-1 Alternative C Alternate Junction with SR-10 and Alternate Design Land Status and Proposed Disturbance**

| Land Mgmt | Road Distance (miles) | County Jurisdiction | Construction Disturbance (acres) | Existing Road Disturbance (acres) | Staging Areas (acres) | Pull-Outs (acres) | Total New Surface Disturbance (acres) |
|---|---|---|---|---|---|---|---|
| USFS | 2.3 | Sevier | 24.0 | 3.3 | 5 | 0.3 | 26.0 |
| BLM | 2.8 | Sevier | 23.6 | 1.4 | 5 | 0.3 | 27.5 |
| SITLA | 1.1 | Sevier | 12.3 | 0.9 | 5 | 0 | 16.4 |
| Private | 2.9 | Sevier & Emery | 31.4 | 5.0 | 0 | 0 | 26.4 |
| Totals | 9.1 | | 91.3 | 10.6 | 15 | 0.6 | 96.3 |

The road construction corridor and staging area details for this alternative would be similar to the information presented in Alternative B, except this alignment would not require alteration of the SR-10 bridge crossing over Quitchupah Creek since no additional traffic lanes for accelerating and turning vehicles would be necessary at that site.

**Pullouts**

Pullouts are proposed for each of the build alternatives. Each would be 30 feet wide by 100 feet long unless the design is to use the existing road. Pullouts for Alternative C are proposed at the following stations:

| | |
|---|---|
| Station 12+00 to 13+00 | north side of proposed road |
| Station 60+00 to 63+50 | north side, use existing road as pullout |
| Station 121+00 to 122+00 | south side of road |
| Station 175+50 to 180+00 | south side, use existing road as pullout |
| Station 287+00 to 288+00 | south side of road |
| Station 430+00 to 431+00 | north side of road |

**SR-10 Junction**

The proposed road would junction with SR-10 approximately 3.0 miles south of the Town of Emery, creating a new intersection. Because the proposed road would carry coal truck traffic, both right and left turn lanes would be required for the proposed road. Since there is little grade for northbound traffic, an acceleration lane of 1,380 feet would be required for the coal truck traffic (**Figure 2-7**). Thus, there would be three lanes south of the intersection and four lanes north of the intersection. This construction would be under the direction of UDOT, and to UDOT and AASHTO standards. The disturbance for construction of the intersection and additional lanes would occur within the UDOT right-of-way or acquired right-of-way. An access permit would be required from UDOT for the junction with SR-10.

**Construction Procedures**

The design, preparation of right-of-way and roadbed, and general construction procedures of this alternative route would be similar to the information presented in Alternative B. BMPs are provided in **Appendix B**.

**Stream Crossings and Culverts**

The road alignment for Alternative C would require a total of 44 culvert crossings. **Figure 2-8** shows the typical channel realignment and **Figure 2-9** shows the locations of these crossings. This includes 22 primary crossings and 22 secondary crossings. The western-most 34 of these crossings would be the same crossings as would be required under Alternative B. Both primary and secondary culvert crossings would be designed to pass the 100-year flow, as calculated by Utah Department of Transportation methodology (UDOT, 2002). **Table 2.3-2** shows the 22 primary culvert locations, design flows, and culvert diameters.

Depending upon the season of construction, up to six of these crossings would be expected to be wet. BMPs that would be implemented during culvert design, placement, and maintenance are described in **Appendix B**.

In addition to the crossing culverts, numerous borrow ditch relief culverts would be used to direct and control road and upgradient runoff. They would be spaced at 500-foot intervals or less, depending upon road slope and proximity to stream channels. BMPs that apply to borrow ditch relief and other road drainage issues are contained in **Appendix B**.

**Table 2.3-2 Primary Culvert Crossing Information - Alternative C**

| Station | Design Flow (cubic feet per second) | Culvert Diameter (inches) RCMP unless noted |
|---|---|---|
| 11+00 | 123 | 60 |
| 18+00 | 173 | 72 |
| 66+00 | 234 | 84 |
| 94+00 | 252 | 84 |
| 186+50 | 117 | 96 |
| 190+50 | 39 | 42 |
| 201+00 | 123 | 60 |
| 203+50 | 26 | 36 |
| 213+50 | 108 | 60 |
| 228+50 | 1702 | 3 (108)* |
| 232+50 | 1702 | 3 (108)* |
| 250+00 | 1144 | 2 (108)* |
| 251+50 | 2800 | 300 by 120 (box)* |
| 256+50 | 2800 | 300 by 120 (box)* |
| 268+00 | 282 | 84 |
| 300+00 | 156 | 60 |
| 323+50 | 117 | 60 |
| 392+00 | 500 | 108 |
| 410+00 | 140 | 84 |
| 422+50 | 220 | 96 |
| 434+50 | 550 | 120 |
| 463+00 | 100 | 60 |

*These crossings would provide fish passage.
Note: At crossings where fish passage is required, specialized culverts may be used, and diameter/type may vary from what is given above. However, in all cases, capacity will be capable of passing the 100-year flow at a minimum.

**Stream Re-Alignment**
Stream realignment would be required at all of the same locations as for Alternative B: in upper Convulsion Canyon, lower East Spring Canyon, and in Quitchupah Creek at the Rock Art sites. The stream realignment process requires a State of Utah Stream Alteration Permit. For this project, because an individual COE permit would also be needed for the wetland fill, the COE has asked to handle all stream realignment and crossing permits under the single COE 404 permit, rather than using the joint state/federal GP40 Permit under the Stream Alteration rules. The permit would set conditions for hydraulic design of each realigned section to maintain the integrity of the creek both upstream and downstream. Further, **Appendix B** provides BMPs that would be used in the design and construction of these realigned sections.

**Reclamation**
Reclamation along the Alternate Junction with SR-10 alignment would be similar to the reclamation procedures identified in Alternative B (See **Appendix B** - BMPs). The erodible soils on the west end of the alternate route would require the use of erosion matting to protect the soil surface and ensure seed germination on the reclaimed soils in this area.

**Road Use**
Use of the Alternate Junction with SR-10 road alignment would be equivalent to that identified in Alternative B.

**Operation and Maintenance**
Operation and maintenance actions and requirements along the Alternate Junction with SR-10 would be equivalent to those identified in Alternative B, except that additional maintenance, by the SSD, of wildlife/livestock infrastructure such as fencing and underpasses would also be required. Monitoring of maintenance would be conducted by the BLM.

### Applicant-Committed Environmental Protection Measures for Alternative C

These measures would be the same as those for Alternative B with the addition of the following:

1. An underpass for wildlife would be constructed at Station 377+00. Deer use a north-south corridor to move to the agricultural fields and creek for food and water, and return via the same corridor to seek cover in the terrain north of the gap.

### Agency-Committed Environmental Protection Measures for Alternative C

These measures would be the same as those for Alternative B.

## 2.4 Alternative D - Water Hollow Road Alignment

Water Hollow is a large northeast-southwest trending drainage that cuts through Old Woman Plateau on the Fishlake National Forest. The Alternative D - Water Hollow Road would utilize the Quitchupah Creek Road Alignment for 2.0 miles of the westernmost portion of its alignment. At this point, it crosses Quitchupah Creek and follows to the south of this drainage to Water Hollow. This Alternative continues in an easterly direction along an existing jeep trail to Water Hollow Benches where it then turns south to Saleratus Benches. From Saleratus Benches, the Water Hollow Road Alternative then turns north and east to connect with SR-10.

The Water Hollow Road Alternative alignment is about 7,550 feet above mean sea level (AMSL); this alignment is 11.25 miles long and drops 1,430 feet in elevation for an average grade of 2.5 percent. The descent into Water Hollow has an average grade of 4 percent, and the ascent out of Water Hollow onto Water Hollow Bench is 7 percent for 900 feet. The crossing of Water Hollow would require large cuts up to 65 feet deep on both approaches and a large fill 90 feet high and 350 feet wide. This alignment also crosses several other large perennial and ephemeral tributary drainages, for a total of 20 primary crossings. The acreage of impact for the Water Hollow Road is 146.3 acres (**Figure 1-2**). Except for the western end where the Water Hollow road would obliterate the existing two-track road (approximately 2.1 miles), the existing road would remain in place, but signs would be posted ("*NOT MAINTAINED FOR NORMAL TRAFFIC"*) to discourage use. At the Forest boundary, motorized access to the paved road would be restricted.

**Lands**

The lands crossed by this build alternative include mostly public lands and one parcel of private land (**Appendix A**). Public lands include those managed by the BLM, Richfield Field Office headquartered in Richfield in Sevier County. The National Forest System lands are managed by the Fishlake National Forest headquartered in Richfield, Utah. The private landowner is Castle Valley Ranches, LLC (see **Figures 2-2 and 2-10**).

**Table 2.4-1** describes the length of the Water Hollow Road alternative within each jurisdiction and the estimated disturbance.

**Table 2.4-1 Alternative D - Water Hollow Road Land Status and Proposed Disturbance**

| Land Mgmt | Road Distance (miles) | County Jurisdiction | Construction Disturbance (acres) | Existing Road Disturbance (acres) | Staging Areas (acres) | Pull-Outs (acres) | Total New Surface Disturbance (acres) |
|---|---|---|---|---|---|---|---|
| USFS | 2.52 | Sevier | 30.5 | 2.6 | 5.0 | 0.3 | 33.2 |
| BLM | 7.94 | Sevier | 95.3 | 0 | 10.0 | 0.6 | 105.9 |
| SITLA | 0.26 | Sevier | 2.4 | 0 | 0 | 0 | 2.4 |
| Private | 0.53 | Sevier | 4.8 | 0 | 0 | 0 | 4.8 |
| Totals | 11.25 | | 133.0 | 2.6 | 15.0 | 0.9 | 146.3 |

Details for design and construction are available for this alternative alignment (**Appendix B**).

**Pullouts**

Pullouts are proposed for each of the build alternatives. Each would be 30 feet wide by 100 feet long unless the design is to use the existing road. Pullouts for Alternative D are proposed at the following stations:

| | |
|---|---|
| Station 12+00 to 13+00 | north side of proposed road |
| Station 60+00 to 63+50 | north side, use existing road as pullout |
| Station 121+00 to 122+00 | south side of road |
| Station 174+50 to 175+50 | south side of road |
| Station 182+00 | north side of road, access point from old road |
| Station 219+00 to 220+00 | south side of road |
| Station 239+00 to 240+00 | east side of road |
| Station 299+00 to 300+00 | east side of road |
| Station 325+00 to 326+00 | east side of road |
| Station 497+00 to 498+00 | north side of road |

**SR-10 Junction**

The proposed road would junction with SR-10 approximately 6.5 miles south of Emery Town and 2.0 miles south of Quitchupah Creek bridge, creating a new intersection. Because the proposed road would carry coal truck traffic, both right and left turn lanes would be required for the proposed road. Since there is little grade for northbound traffic, an acceleration lane of 1,380 feet would be required for the coal truck traffic (**Figure 2-11**). Thus, there would be three lanes south of the intersection and four lanes north of the intersection. This construction would be under the direction of UDOT and according to UDOT and AASHTO standards. An access permit would be required from UDOT.

The disturbance for construction of the intersection and additional lanes would occur within the UDOT right-of-way or acquired right-of-way.

**Wildlife Bridge Crossings**

Big game animals cross this road area to access winter and summer ranges, thus wildlife crossings must be constructed at strategic locations along the route to facilitate migration patterns.

Utah Division of Wildlife Resource guidelines suggest the following: "Structures designed to allow wildlife passage below the road should meet an "openness ratio" of one or greater. This is to say that the width of the bridge multiplied by the height of the bridge, divided by the length of the bridge, should be at least "1". Since these bridges must accommodate mature bull elk, the height of the bridge must be at least 16 feet to allow for antler clearance (Jones, 2005, Letter from Derris Jones, Regional Supervisor, S.E. Region, UDWR, August 31, 2005).

**Stream Crossings and Culverts**

The road alignment for Alternative D would require a total of 44 culvert crossings and five bridge crossings (as per UDWR recommendations, Mead 2005, email from Leroy Mead, UDWR, 3-30-2005). **Figure 2-12** shows the locations of these crossings. This includes 20 primary crossings and 29 secondary crossings. The western-most 4 of these crossings would be the same crossings as would be required under Alternative B. Both primary and secondary culvert crossings, and bridges, would be designed to pass the 100-year flow, as calculated by UDOT methodology (UDOT, 2002). **Table 2.4-2** shows the primary culvert crossing locations, design flows, and culvert diameters; as well as the recommended wildlife crossing bridge locations. Two additional wildlife bridge crossings are suggested by UDWR and shown in the table. Final number, placement, and design of wildlife bridge crossing structures would be determined during project implementation in consultation with the UDWR and BLM biologists.

Depending upon the season of construction, three of these crossings would be expected to be wet. BMPs that would be implemented during culvert design, placement, and maintenance are described in **Appendix B**.

In addition to the crossing culverts, numerous borrow ditch relief culverts would be used to direct and control road and upgradient runoff. They would be spaced at 500-foot intervals or less, depending upon road slope and proximity to stream channels. BMPs that apply to borrow ditch relief and other road drainage issues are contained in **Appendix B**.

**Table 2.4-2 Primary Culvert Crossing Information - Alternative D**

| Station | Design Flow (cubic feet per second) | Minimum Culvert Diameter (inches)/ Bridge Crossing RCMP unless noted |
|---|---|---|
| 11+00 | 123 | 60 |
| 18+00 | 173 | 72 |
| 66+00 | 234 | 84 |
| 94+00 | 252 | 84 |
| 121+50 | 419 | Wildlife Bridge** |
| 131+50 | 125 | 72 |
| 177+00 | 1060 | Wildlife Bridge** |
| 229+50 | 52 | Wildlife Bridge** |
| 255+00 | 56 | Wildlife Bridge** |
| 306+50 | 120 | Wildlife Bridge** |
| 338+00 | 75 | 54 |
| 339+50 | 75 | 54 |
| 341+50 | 58 | 48 |
| 366+50 | 66 | 48 |
| 384+50 | 42 | 48 |
| 412+50 | 324 | 72 |
| 419+00 | 9 | 96 |
| 432+00 | 173 | 48 |
| 463+00 | 356 | 96 |
| 471+00 | 53 | 96 |
| 359+40 | | Wildlife Bridge ** (Additional UDWR suggested) |
| 507+80 or 491+90 or 493+10 | | Wildlife Bridge ** (Additional UDWR suggested) |

*Crossing would provide for fish passage.
** These crossings are addressed in mitigation measures for wildlife.
*Note:* At crossings where fish passage is required, specialized culverts may be used, and diameter/type may vary from what is given above. However, in all cases, capacity will be capable of passing the 100-year flow at a minimum.
*Additional Note:* Structures designed to allow wildlife passage below the road should meet an "openness ratio" of one or greater. This is to say that the width of the bridge multiplied by the height of the bridge, divided by the length of the bridge, should be at least "1".

**Stream Realignment**

Stream realignment would be required at two of the locations proposed under Alternative B or C: in upper Convulsion Canyon (two realigned segments) and in lower East Spring Canyon. There would be no realignment needed in Quitchupah Creek at the Rock Art site. The stream re-alignment process requires a State of Utah Stream Alteration Permit. For this project, because an individual COE permit would also be needed for the wetland fill, the COE has asked to handle all stream realignment and crossing permits under the single COE 404 permit, rather than using the joint state/federal GP40 Permit under the Stream Alteration rules. The permit would set conditions for hydraulic design of each realigned section to maintain the integrity of the creek both upstream and downstream. Further, **Appendix B** provides BMPs that would be used in the design and construction of these realigned sections.

**Construction Procedures**
Wherever possible, design and construction practices similar to those described for the Quitchupah Creek Road alignment (Alternative B) would be followed. However, the Water Hollow alternative alignment crosses significantly rougher terrain for much of its route and more extensive cuts and fills would be necessary, as well as perhaps more substantial blasting requirements. This may require a longer period of construction. Road operations, maintenance, and usage would be similar to those described for the Quitchupah Creek Road alignment. BMPs are provided in **Appendix B**.

## Applicant-Committed Environmental Protection Measures for Alternative D

*Wetlands*
The plans for replacement of wetlands and riparian communities in the upper section of Alternative D are presented under Alternative B.

*Water*
The coal truck cleaning measure for this Alternative is the same as was presented in Alternative B.

In addition, the applicant would be responsible for constructing and maintaining water bars along the remaining segments of the existing Quitchupah Creek Road to improve storm drainage, and reduce erosion and sedimentation. These water bars would be constructed to agency specifications in regard to size, location, and outflow considerations. A maintenance schedule would also be stipulated by the agencies.

*Raptor Protection*
The removal of animal carcasses from the road is same as detailed in Alternative B.

*Wildlife Bridge Crossings*
Big game animals would need to cross this road alignment in order to access winter and summer ranges, Five wildlife crossing structures are planned for strategic locations along the route to facilitate migration patterns. These structures would be designed to allow wildlife passage below the road, and in order to accommodate mature bull elk, the height of the bridges must be at least 16 feet to allow for antler clearance.

*Livestock*
The riparian fencing and the managed trailing for livestock on the Forest allotment are the same as presented in Alternative B.

*G.L. Olsen Allotment*
Since a relatively high number of cattle are concentrated in this small allotment, the proposed road would need to be fenced to restrict cattle access to the road. Also the road in the allotment is mostly cut below the natural grade, creating a wide ditch with steep sideslopes making it difficult for cattle to enter and exit the ditch. To control the cattle and better manage the allotment, the proposed road would be fenced.

The fencing would extend on both sides of the cuts and/or fills from Station 187+00 on the west to Station 275+00 on the east, a distance of 8,800 feet (1.6 miles). Cattleguards on the proposed road and natural barriers at each end of the fence would restrict cattle movement past the fenced portions of the road. On the west, the cliffs and cattleguard would prevent cattle from entering Water Hollow. This would relieve grazing pressure on the narrow riparian zone in Water Hollow and on The Cove tributary. On the east, the cattleguard and natural barriers of the drainages with cliffs would prevent cattle drift into the Saleratus Allotment. Gates located every mile would allow cattle to be moved across the proposed road as needed

and would allow cattle that did accidentally enter upon the roadway to be removed. See Figures PP-07-10 in **Appendix B**.

Since the cattle would be blocked from watering in Water Hollow, and the two ponds on the east are usually dry, a water system would need to be developed to provide water for the cattle during the short grazing season. The system would consist of 5,000 gallon (or larger) water storage tanks located at Stations 223+00 and 261+00 with a pipe system extending to water troughs located 500 to 1,300 feet away from the proposed road on both sides of the road. The system would be gravity-fed with water levels in the troughs controlled by float valves. The SSD would haul water to the storage tanks located along the road during the 4-6 week grazing season. Two watering systems are required because of deep drainages with cliffs blocking movement of cattle between the seedings. See Figures PP-08 & 11 in **Appendix B**.

The allotment, divided by the road, fenced, with watering troughs on both sides of the road, would then be managed as a two pasture allotment. The turn-in pasture would be rotated each year to better manage the forage. The cattle would be moved internally between pastures as stipulated in the allotment management plan and would cross the road at a designated time when coal transport was not scheduled or coal transport was halted to allow for the crossing. Cattle would enter and exit the allotment via a trail directly from Quitchupah Creek to the north.

*Saleratus Allotment*
Because the cattle concentrate on the lower elevations of this allotment, fencing would be needed to restrict cattle access to the proposed road. The fence would start at Station 435+00 on the west where steep terrain combined with a cattleguard on the road would block westward cattle movement. The fence would extend east across the lower slopes and valleys to Station 594+50 where it would join with the right-of-way fencing along SR-10. A cattleguard would also be installed here to prevent cattle on the road from entering the SR-10 roadway. Gates every mile would allow for any needed cattle movement north and south or removal of trespass cattle on the road. There would be about 19,000 feet (3.6 miles) of fencing.

The cattle would be moved across this road if needed, either by moving when coal transport is not scheduled or scheduling a halt to transport so the cattle would be moved at a designated time.

There would be no fencing on approximately 16,000 feet (about 3 miles) in the rough terrain adjacent to the upper benches.

*Livestock Trail*
The construction of 1.5 miles of trail for livestock is the same as presented in Alternative B.

### Agency-Committed Environmental Protection Measures for Alternative D

These measures would be the same as those for Alternative B in Convulsion Canyon.

## 2.5 Best Management Practices

General best management practices (BMPs) related to road design, construction, reclamation, and operation are described in detail in **Appendix B**. These practices, based upon sound, tested techniques from established government sources (e.g., US Forest Service, BLM, and State of Utah), would be closely adhered to throughout the Project.

Prior to start of the project, an Alternative-specific BMP Report, which relates specifically to potential resource impacts of that alternative, would be prepared to mitigate for any impacts which might occur during the construction of the road. This BMP report would relate to storm water protection and water quality monitoring. A schedule would be set up for the monitoring of all BMPs, and the construction supervisor, using a checklist, would observe and write down project conditions and compliance with the BMP report. That person would also make recommendations as to the repair or addition of BMPs. The reports would be placed in a central location and made available to any construction inspectors. At the end of the project, the reports would be placed into the As-built Report.

A site plan would be developed which identifies the physical features of the site, the location of the proposed development, and the location of temporary and/or permanent BMPs. The purpose of this would be to minimize earth movement and vegetation removal, avoid steep slopes, and retain natural drainage systems. It also includes maintenance of this plan by updating it regularly as conditions change, and describes grading season and construction practices, access roads, dust control and topsoil management, and designs of temporary and permanent soil stabilization through engineered and bio-engineered techniques.

## 2.6 Other Scenarios Considered But Eliminated From Detailed Study

Other alternatives or scenarios considered during agency review of the Proposed Action and during public scoping focused on different routes for the road or different methods to ship the coal to market.

**Alternate Road Access**
Different routes proposed basically considered constructing a road across the Old Woman Plateau or through Link Canyon. The Old Woman Plateau is an area south of the SUFCO Mine portal mostly on National Forest system lands that are managed as a Research Natural Area (RNA), portions of which have restrictions prohibiting vehicle travel, so the construction of a transport road would require modifications of the existing Forest management direction. The route through Link Canyon is located just west of the Town of Emery. Link Canyon has a good county-maintained road to the old mine workings where a portal could be located for loading trucks. The portal was identified in the Pines Tract EIS as a potential site for accessing coal in the Pines Tract. However, under the SUFCO mine plan and mining schedule this site is not economically feasible for construction and operation of a loadout. Issues such as constructing a way through naturally burned or oxidized coal at the portal site and restructuring the mine conveyor system to discharge at this portal site were expensive items. The mine engineers for the BLM in a meeting on June 23, 2000, after reviewing the mine plans and conceptual plans for a Link Canyon Portal, advised the responsible USFS and BLM officials that a portal plan was not economically viable (**Appendix C**).

**Conveyor Systems**
Different methods to transport coal centered on constructing conveyor systems to convey coal to a loadout facility where trucks would transport the coal to destinations in Carbon County. One conveyor system suggested would begin at the SUFCO Mine portal, traverse down East Spring Canyon to Quitchupah Creek where a loadout facility would be constructed. The terrain in East Springs Creek Canyon is too rugged and steep for a conveyor system so this alternative is not feasible from an engineering standpoint. A conveyor system in Link Canyon was also suggested, because a county road currently exists in the canyon. A conveyor system in Link Canyon would require a loadout facility in the vicinity of Emery Town to load the trucks destined for Carbon County. But because the portal facility was not economically feasible, a conveyor system in Link Canyon becomes a moot point.
A slurry system was also considered but the water demands are beyond the area's capability to provide, so this system was also not considered feasible.

Muddy Creek, a deep canyon on the north side of the Pines Tract, which is now being mined through the SUFCO Mine, was also considered as a possible portal site and coal transport route. However, the two primary problems with this alternative are: 1) a route in the canyon would be rough and steep and located adjacent to a stream that provides culinary water, a problem for maintaining water quality, and 2) the mine plan as explained in the preceding discussion on a portal in Link Canyon is not economically feasible.

## 2.7 Summary Comparison of Alternatives Relative to Issues

**Table 2.7-1** presents a summary comparison of resources potentially affected by each Alternative. The information presented in this table is a summary comparison of the data presented in detail in Chapter 3 of this EIS. The effects identified in this table also assume that applicant-committed measures and mitigation have been implemented. The comparison of effects also includes effects that are common to all build Alternatives to demonstrate the relative effect of each Alternative.

## 2.8 Past, Present, Reasonably Foreseeable Future Actions

Council of Environmental Quality (CEQ) regulations (40 CFR 1508.7) define cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Past, present, and foreseeable future actions in the Quitchupah Creek Road Project Area have been developed, and summaries are included in **Appendix D**. The action, year of occurrence, and estimates of residual, current, or anticipated effects, if any, are presented in tables provided in **Appendix D**. Actions are grouped by resource. The sum of the effects of these actions, in addition to the anticipated direct and indirect effects of the Proposed Action, forms the basis for the cumulative effects analysis.

The cumulative area for most resources is the Quitchupah Creek Road Project Area, which is defined as the Quitchupah Creek watershed west of SR-10 and excluding the North Fork and Link Canyon drainage areas. The Quitchupah Creek watershed area as defined includes Convulsion Canyon, East Spring Canyon (where SUFCO Mine is located), the lower portion of Water Hollow Creek, the drainages on Water Hollow and Saleratus benches, the junction of Quitchupah Creek and North Fork, and the lower portion of Link Canyon. These imposed boundaries generally follow the cliffs and escarpments on either side of Quitchupah Creek and tributaries.

The cumulative area for transportation and socioeconomics includes the tri-county area of Carbon, Emery, and Sevier Counties, the affected area for this project. Cumulative effects are discussed in each resource section in Chapter 3.

**Table 2.7-1 Comparison of Alternatives**

| Key Issue | Alternative | | | |
|---|---|---|---|---|
| | **A - No Action** | **B - Proposed Road** | **C - Junction & Design** | **D - Water Hollow Road** |
| **Water Quality** | | | | |
| 1- Quitchupah Creek | 1 - Erosion continues on exposed existing road surface and from uplands with poor vegetation cover | 1 - Accelerated erosion from increased road disturbance; partially offset by BMPs and environmental commitments | 1 - Accelerated erosion from increased road disturbance; partially offset by BMPs and environmental commitments | 1 - Accelerated erosion from increased road disturbance, large cut/fill requirements, and retention of old road; partially offset by BMPs and greater distance to stream for new alignment |
| 2 - Salinity, Colorado River & 303d listing of lower creek | 2 - Salinity in creek continues at existing levels, primarily due to grazing, irrigation, and natural processes | 2 - Major sources of salinity continue; potential road contributions minimal in relation to other sources | 2 - Major sources of salinity continue; potential road contributions minimal in relation to other sources | 2 - Major sources of salinity continue; potential road contributions minimal in relation to other sources |
| 3 - major culverts or crossings | 3 - No change in number or type of crossings; no change in consequences due to risk of crossing failure | 3 – 18 total primary crossings; assigned rating of consequences due to risk of crossing failure is 1 | 3 – 22 net primary crossings; calculated rating of consequences due to risk of culvert crossing failure is 1.2 | 3 – 20 new primary crossings; calculated rating of consequences due to risk of culvert crossing failure is 1.4 |
| 4 - sedimentation potential, road <500 feet to creek | 4 - 35,400 feet | 4 - 33,800 feet | 4 - 32,300 feet | 4 - 38,900 feet |
| **Soils** | | | | |
| 1 – highly erodible soils | 1 - 60 percent or 29,200' of the existing two-track road is in erodible soils | 1 - 60 percent or 29,200' of the road would be in erodible soils | 1 - 65 percent or 32,400' of the road would be in erodible soils | 1 - 56 percent or 32,800' of the road would be in erodible soils |
| 2 - shrink-swell soils | 2 - 32 percent or 15,700' | 2 - 32 percent or 15,700' | 2 - 40 percent or 19,400' | 2 - 58 percent or 33,900' |
| 3 - Farmland soils | 3 - 0.0 acres impacted | 3 - 1.4 acres impacted (less than 1% of 145 acres) | 3 - 1.4 acres impacted (less than 1% of 145 acres) | 3 – 0.0 acres impacted |
| **Vegetation** | | | | |
| 1 - riparian | 1 - No filling of riparian zone | 1 - Approximately 1.0 acre of riparian zone at two locations would be filled | 1 - Approximately 1.0 acre of riparian zone at two locations would be filled | 1 - Approximately 1.0 acre of riparian zone at two locations would be filled |
| 2 - noxious weeds | 2 - The existing scattered colonization would continue | 2 - Disturbances in the 8.9 mile road corridor could be subject to noxious weed invasion | 2 - Disturbances in the 9.1 mile road corridor could be subject to noxious weed invasion | 2 - Disturbances in the 11.25 mile road corridor could be subject to noxious weed invasion |
| 3 - riparian protection through restricted or no grazing | 3 - no protection | 3- 4.7 miles of protection | 3- 4.7 miles of protection | 3- 4.7 miles of protection |
| 4 - specific analysis | 4 - Impacts to vegetation would occur due to grazing; road maintenance on east end, | 4 - The 8.9 mile road corridor would cause disturbance in 5 different plant communities | 4 - The 9.1 mile road corridor would cause disturbance in 5 different plant communities | 4 - The 11.25 mile road corridor would cause disturbance in 5 different plant communities |
| 5 – Wetlands | 5 –Grazing-related impacts to existing wetlands would continue | 5 – 0.33 acres of wetland filled, but a greater than 3:1 mitigation ratio proposed | 5 – 0.33 acres of wetland filled, but a greater than 3:1 mitigation ratio proposed | 5 – 0.33 acres of wetland filled, but a greater than 3:1 mitigation ratio proposed |

**Table 2.7-1** continued

| Key Issue | Alternative | | | |
|---|---|---|---|---|
| | **A - No Action** | **B - Proposed Road** | **C - Junction & Design** | **D - Water Hollow Road** |
| **Wildlife** | | | | |
| 1 - road hazard | 1 - Road not a hazard to wildlife | 1 - Wildlife collisions would be greatly reduced due to fencing along the 8.9 mile road corridor | 1 - Wildlife collisions would be greatly reduced due to fencing and underpasses along the 9.1 mile corridor | 1 - Wildlife collisions would be greatly reduced due to fencing and underpasses along the 11.25 mile corridor |
| 2 - displacement | 2 - Low level of human activity | 2 - Human activity along 8.9 mile road corridor would cause displacement of wildlife | 2 - Human activity along 9.1 mile road corridor would cause displacement of wildlife | 2 - Human activity along 11.25 mile road corridor would cause displacement of wildlife |
| 3 - winter range seeding | 3 - no additional seedings | 3 - no additional seedings | 3 - no additional seedings | 3 - up to 700 acres of seedings |
| 4 – fragmentation | 4 - minor along existing road/track | 4 - 9 miles of divide between uplands and riparian | 4 - 7 miles of divide between uplands and riparian | 4 - 2 miles of divide between uplands and riparian |
| 5 – noise | 5 – manmade noise distant or infrequent | 5 – Increase in noise would create wildlife road avoidance zones | 5 – Increase in noise would create wildlife road avoidance zones | 5 – Increase in noise would create wildlife road avoidance zones |
| **Fisheries** | | | | |
| 1 - spills in stream | 1 – no increased risk of spill to stream | 1 – spill potential small, but if occurred, likely to reach stream | 1 - spill potential small, but if occurred, likely to reach stream | 1 - spill potential small, and unlikely to reach stream over much of the road length |
| 2 - sediments, TDS, turbidity, etc | 2- 35,400’ of road within 500’ of Quitchupah Creek as potential sediment source with no BMPs imposed | 2 – 33,800’ of road within 500’ of Quitchupah Creek as potential sediment source, risk partially reduced by BMPs | 2 – 32,300’ of road within 500’ of Quitchupah Creek as potential sediment source, risk partially reduced by BMPs | 2 – 38,900’ of road within 500’ of Quitchupah Creek as potential sediment source, risk partially reduced by BMPs (includes existing two-track road that would remain in place) |
| **TES Species** | | | | |
| 1 - TES plants | 1 - Little potential to impact TES plants | 1 - A high potential to impact TES plant habitats | 1 - A high potential to impact TES plant habitats | 1 - A low potential to impact TES plant habitats |
| 2 - TES fish, impacts due to sedimentation | 2 - Continued sedimentation may affect fish populations | 2 - Little change in sedimentation throughout Project Area | 2 - Little change in sedimentation throughout Project Area | 2 - No change in sedimentation throughout Project Area |
| 3 - Section 7 | 3 - No Effect | 3 - No adverse effect (MANLAA) | 3 - No adverse effect (MANLAA) | 3 - No adverse effect (MANLAA) |
| 4 - MIS species | 4 - No additional impacts | 4 - >0.1% of sagebrush habitat disturbed | 4 - >0.1% of sagebrush habitat disturbed | 4 - >0.1% of sagebrush habitat disturbed |

**Table 2.7-1** continued

| Key Issue | Alternative | | | |
|---|---|---|---|---|
| | **A - No Action** | **B - Proposed Road** | **C - Junction & Design** | **D - Water Hollow Road** |
| **Range Resources** | | | | |
| 1 - loss of forage due to road construction | 1 - 0 AUMs | 1 - 4 AUMs | 1 - 4 AUMs | 1 - 5 AUMs |
| 2 - changes in livestock operations | 2 - No changes | 2 – Livestock would utilize segments of fenced corridor for trailing | 2 - Livestock would utilize segments of fenced corridor for trailing | 2 - Livestock would utilize segments of fenced corridor for trailing |
| 3 - road hazard | 3 - Not a hazard | 3 – Minimal hazard as livestock would be fenced from road | 3 - Minimal hazard as livestock would be fenced from road | 3 - Minimal hazard as livestock would be fenced from road |
| 4 - feed production on private land | 4 - No Effect on impact to pastures | 4- The elimination of 1.4 acres of pasture land would reduce feed production slightly (less than 1%) | 4 - The elimination of 1.4 acres of pasture land would reduce feed production slightly (less than 1%) | 4 - No impact to pastures |
| 5 – changes in in-stream watering | 5 – No changes in watering | 5 – Riparian fencing would restrict livestock to specific locations for watering in-stream along 4.7 miles of Quitchupah Creek | 5 – Riparian fencing would restrict livestock to specific locations for watering in-stream along 4.7 miles of Quitchupah Creek | 5 – Riparian fencing would restrict livestock to specific locations for watering in-stream along 4.7 miles of Quitchupah Creek |
| 6 – loss of forage due to riparian fencing | 6 – 0 AUMs | 6 – 5 AUMs | 6 – 5 AUMs | 6 – 5 AUMs |
| 7 – Changes to allotments | 7 – No changes to allotments | 7 – E. Olsen allotment split by fencing of the road; cattle must be moved to each side | 7 – E. Olsen allotment split by fencing of the road; underpass provides easy access | 7- G.L. Olsen Allotment split by fencing of road; cattle must be moved to each side; water source cut off, therefore water provided by toll user |
| **Land Use and Recreation** | | | | |
| 1 - traditional uses | 1 - Traditional uses unaffected | 1 - The introduction of easy access and industrialization would reduce or eliminate many traditional uses | 1 - The introduction of easy access and industrialization would reduce or eliminate many traditional uses | 1 - The introduction of easy access and industrialization would reduce or eliminate many traditional uses |
| 2 – ATV/OHV access | 2 - Existing road would remain open for use as ATV/OHV route | 2 - Existing road would no longer be available as ATV/OHV route | 2 - Existing road would no longer be available as ATV/OHV route | 2 – Much of the existing road would remain accessible as ATV/OHV route; 2.1 miles of route on FS land not available |
| 3 - roadless (USFS) | 3 - No roadless issues in area | 3 - No roadless issues in area | 3 - No roadless issues in area | 3 - No roadless issues in area |
| 4 - other facilities | 4 - Facilities built around existing road | 4 - Road construction would affect mine wastewater system, fences, and power line | 4 - Road construction would affect mine wastewater system, fences, and power line | 4 - Road construction would affect mine wastewater system, fences, and power line |
| 5 - private lands | 5 - Road easements covered by prescriptive rights-of-way | 5 - The road would cross 3.7 miles of private land requiring the acquisition of rights-of-way from six landowners | 5 - The road would cross 2.9 miles of private land requiring the acquisition of rights-of-way from two landowners | 5 - The road would cross 0.53 miles of private land requiring the acquisition of rights-of-way from one landowner |

AUM = Animal Unit Month

**Table 2.7-1** continued

| Key Issue | Alternative | | | |
|---|---|---|---|---|
| | **A - No Action** | **B - Proposed Road** | **C - Junction & Design** | **D - Water Hollow Road** |
| **Visual Resources** | | | | |
| 1 - change in aesthetics | 1 - Peaceful and remote | 1 - The road would change nature and peacefulness of this remote area | 1 - The road would change nature and peacefulness of this remote area | 1 - The road would change nature and peacefulness of this remote area |
| 2 - road visibility | 2 - Hardly visible | 2 - The road would be readily visible in the landscape, compared to existing road | 2 - The road would be readily visible in the landscape, compared to existing road | 2 - The road would be readily visible in the landscape, especially at Water Hollow, compared to existing road |
| 3 - Visual Class | 3 - Compatible with Modification and Class IV | 3 - Compatible with Modification and Class IV | 3 - Compatible with Modification and Class IV | 3 - Compatible with Modification and Class IV |
| **ACEC and Wild & Scenic River** | | | | |
| 1- Proposed ACEC | 1 – No Effect | 1 – Impacts to cultural values for which ACEC was nominated | 1 – Impacts to cultural values for which ACEC was nominated | 1 – No Effect |
| 2- Proposed Wild & Scenic River | 2 – No Effect | 2 – Impacts to cultural values for which 1.3 mile segment of Wild & Scenic River was nominated | 2 – Impacts to cultural values for which 1.3 mile segment of Wild & Scenic River was nominated | 2 – No Effect |
| **Cultural Resources** | | | | |
| 1 - rock art | 1 Continued potential for indirect impacts to known rock art sites | 1 – Potential indirect impacts to known rock art sites | 1 – Potential indirect impacts to known rock art sites | 1 - Continued potential for indirect impacts to known rock art sites |
| 2 - impacts to historic and prehistoric sites | 2 - No impacts to sites | 2 - Direct impacts to 6 eligible sites, potential indirect impacts to rock art | 2 - Direct impacts to 10 eligible sites, potential indirect impacts to rock art | 2 - 0 eligible sites impacted |
| 3 - paleontological sites | 3 - No impacts to significant paleontological sites | 3 - No impacts to significant paleontological sites | 3 - No impacts to significant paleontological sites | 3 - No impacts to significant paleontological sites |
| **Native American Concerns** | | | | |
| 1 - sacred values | 1 - No impacts to sacred values | 1 - Direct impacts to sacred values in Convulsion Canyon/ Quitchupah Creek | 1 - Direct impacts to sacred values in Convulsion Canyon/ Quitchupah Creek | 1 - Direct impacts to sacred values in Convulsion Canyon |
| 2 - areas of traditional importance | 2 - No impacts to known cultural resource sites | 2 - Direct and indirect impacts to known cultural resource sites | 2 - Direct and indirect impacts to known cultural resource sites | 2 - Direct and indirect impacts to known cultural resource sites |

**Table 2.7-1** continued

| Key Issue | Alternative | | | |
|---|---|---|---|---|
| | **A - No Action** | **B - Proposed Road** | **C - Junction & Design** | **D - Water Hollow Road** |
| **Transportation** | | | | |
| 1 - reduce distance | 1 - There would be no reduction in the round-trip haul | 1 - Would reduce round-trip haul by 55.4 miles | 1 - Would reduce round-trip haul by 58 miles | 1- Would reduce round-trip haul by 46.7 miles |
| 2 - junction | 2 - No change in existing junction | 2 - The junction would require widening of bridge, the addition of turn lanes, and a long acceleration lane to ascend grades on SR-10 | 2 - The junction would require the addition of two turn lanes on level grade | 2 - The junction would require the addition of two turn lanes on level grade |
| 3 - SR-10 surface | 3 - Coal truck traffic will increase maintenance on SR-10 from milepost 0 to Muddy Creek | 3 - Coal truck traffic will increase maintenance on SR-10 from milepost 9 to Muddy Creek | 3 - Coal truck traffic will increase maintenance on SR-10 from milepost 10 to Muddy Creek | 3 - Coal truck traffic will increase maintenance on SR-10 from milepost 6 to Muddy Creek |
| **Socioeconomics** | | | | |
| 1 – Economic benefits, mine production, mine employment | 1 - Continued mine production, employment, and revenues due to contract sales to east and addition of Muddy tract | 1 - A potential increase in mine production, employment, and revenues due to increased sales to eastern markets and addition of Muddy tract. There are also economic benefits that accrue, in time, for the electrical energy consuming public and industry. Lower cost will allow mine to recover an additional 44 million tons, adding 6 to 10 years to mine life. | 1 - A potential increase in mine production, employment, and revenues due to increased sales to eastern markets and addition of Muddy tract. There are also economic benefits that accrue, in time, for the electrical energy consuming public and industry. Lower cost will allow mine to recover an additional 44 million tons, adding 6 to 10 years to mine life. | 1 - A potential increase in mine production, employment, and revenues due to increased sales to eastern markets and addition of Muddy tract. There are also economic benefits that accrue, in time, for the electrical energy consuming public and industry. Lower cost will allow mine to recover an additional 20 million tons, adding 3 to 5 years to mine life. |
| 2 -Emery County | 2 - Continued economic stimulus and truck traffic due to contract sales | 2 - There would be economic benefits for Emery, Carbon, and Sevier Counties | 2 - There would be economic benefits for Emery, Carbon, and Sevier Counties | 2 - There would be economic benefits for Emery, Carbon, and Sevier Counties |
| 3 - Fuel savings to SUFCO Mine | 3 - No fuel savings to SUFCO Mine due to continued use of longer route | 3 - The shorter haul route would have fuel savings up to 1.6 million gallons per year. | 3 - The shorter haul route would have fuel savings up to 1.7 million gallons per year. | 3 - The shorter haul route would have fuel savings up to 1.4 million gallons per year. |
| 4 - Cost savings to SUFCO Mine | 4 - No cost savings to SUFCO Mine due to continued use of longer route | 4 - $4-10 M annual cost savings due to shorter route | 4 - $4-11 M annual cost savings due to shorter route | 4 - $4-9 M annual cost savings due to shorter route |
| 5 - Lifestyle impacts | 5 - Traditional uses continue in canyon | 5 - Impacts to current canyon users would occur | 5 - Impacts to current canyon users would occur | 5 - Impacts to current canyon users would occur |
| 6 - UDOT Maintenance costs on SR-10 | 6 - Cost of $1.84 million | 6 - Cost of $1.06 million, a savings of $773,000 as compared to No Action | 6 - Cost of $0.92 million, savings of $918,000 as compared to No Action | 6 - Cost of $1.27 million, savings of $564,000 as compared to No Action |
| 7 – Safety | 7 - No second route to SUFCO Mine to lessen congestion and provide additional emergency access | 7 - The new road would reduce the traffic density on the other route, which should make the overall shipping process safer because neither route would carry the full traffic load and the resulting high traffic density. | 7 - The new road would reduce the traffic density on the other route, which should make the overall shipping process safer because neither route would carry the full traffic load and the resulting high traffic density. | 7 The new road would reduce the traffic density on the other route, which should make the overall shipping process safer because neither route would carry the full traffic load and the resulting high traffic density. |

T.22S., R.4E. T.22S., R.5E.

QUITCHUPAH CREEK ROAD, ALTERNATIVE B

WATER HOLLOW, ALTERNATIVE D

BEGIN PROJECT

ACORD LAKES ROAD

NATIONAL FOREST BOUNDARY

Castle Valley Ranches

Jolly Mill Point

Spring

CONVULSION CANYON

OLD WOMAN PLATEAU

FISHLAKE NATIONAL FOREST

NORTH FORK

Quitchupah

Water

Broad Hollow

Collier Hollow

Etheridge Hollow

Mill Hollow

East Spring

JEEP TRAIL

EXPLANATION

- ROAD ALIGNMENT
- OLD WOMAN RNA
- BLM SCENIC RIVER NOMINATION

LAND STATUS

- FOREST SERVICE
- STATE
- BLM
- PRIVATE

INDEX MAP

2000 0 2000 FEET

N

# QUITCHUPAH CREEK ROAD EIS

FIGURE 2–1
LAND STATUS AND OWNERSHIP MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE | DATE DRAWN | REVISION |
|---|---|---|---|---|---|
| LM | CP | | 1"=2000' | 7/2/01 | 10/18/01 7/1/02 7/14/05 |

drawings\QUITCHUPAH\deis 110305\FIGURE 2-1.DWG

T.22S., R.5E. T.22S., R.6E.

NORTH FORK

QUITCHUPAH CREEK ROAD

Quitchupah Creek

Quitchupah Creek

Water Hollow

Water Hollow Benches

LINK CANYON WASH

Link Canyon Wash

SEVIER COUNTY

EMERY COUNTY

ALTERNATE JUNCTION, ALTERNATIVE C

Quitchupah ALTERNATIVE B

WATER HOLLOW, ALTERNATIVE D

STATE HIGHWAY 10

EMERY 3MI

Castle Valley Ranches

Thomas C. Bunn, et al

Thomas C. Bunn, Carolee Hammel

Kenneth Lee, Earlene R. Christiansen

Glendon E. Johnson, Jr.

James V. Olsen, Trustee

Julian L. Bowman

George E. & Patricia L. Olsen, Wynona P. Olsen, Trustee

Emery County

Josiah K. & Etta M. Eardly

Bonnie A. Petty, Trustee

Consolidation Coal Company

END PROJECT

Emery Co.

Gravel

TIONAL FOREST BOUNDARY

The Cove

HIGHLAND NATIONAL FOREST

EXPLANATION

ROAD ALIGNMENT

OLD WOMAN RNA

BLM SCENIC RIVER NOMINATION

LAND STATUS

FOREST SERVICE

STATE

BLM

PRIVATE

INDEX MAP

N

2000 2000 FEET

# QUITCHUPAH CREEK ROAD EIS

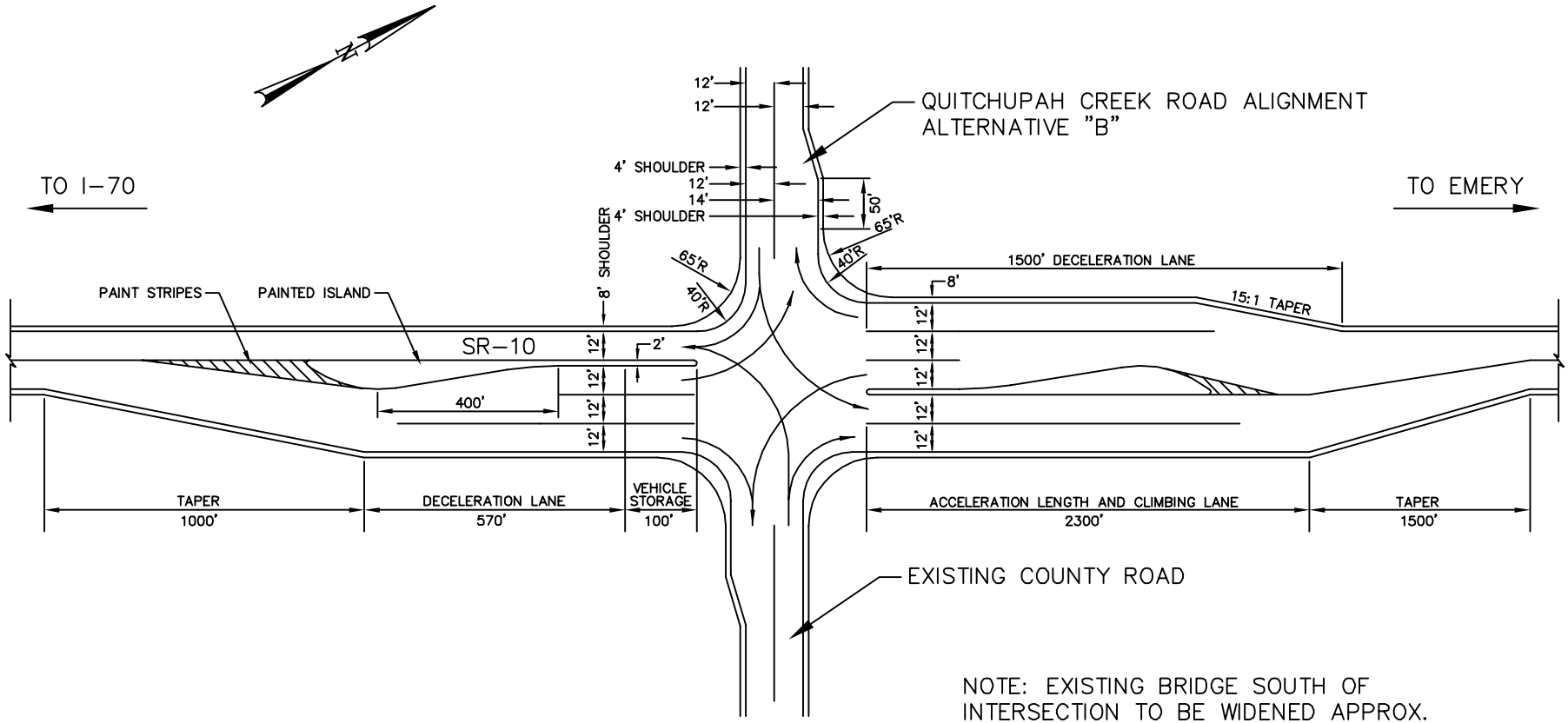
## FIGURE 2–2
## LAND STATUS AND OWNERSHIP MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE | DATE DRAWN | REVISION |
|---|---|---|---|---|---|
| LM | CP | | 1"=2000' | 7/01/02 | 6/13/03 |
| | | | | | 7/14/05 |
| | | | | | 9/28/05 |

drawings\QUITCHUPAH\deis 110305\Figure 2-2.dwg

drawings\Quitchupah\deis 110305\Figure 2-3 7 11.dwg




NOTE: EXISTING BRIDGE SOUTH OF INTERSECTION TO BE WIDENED APPROX. 6' ON WEST SIDE AND 32' ON EAST SIDE.

# QUITCHUPAH CREEK ROAD EIS

FIGURE 2-3
ALTERNATIVE B SR-10 JUNCTION

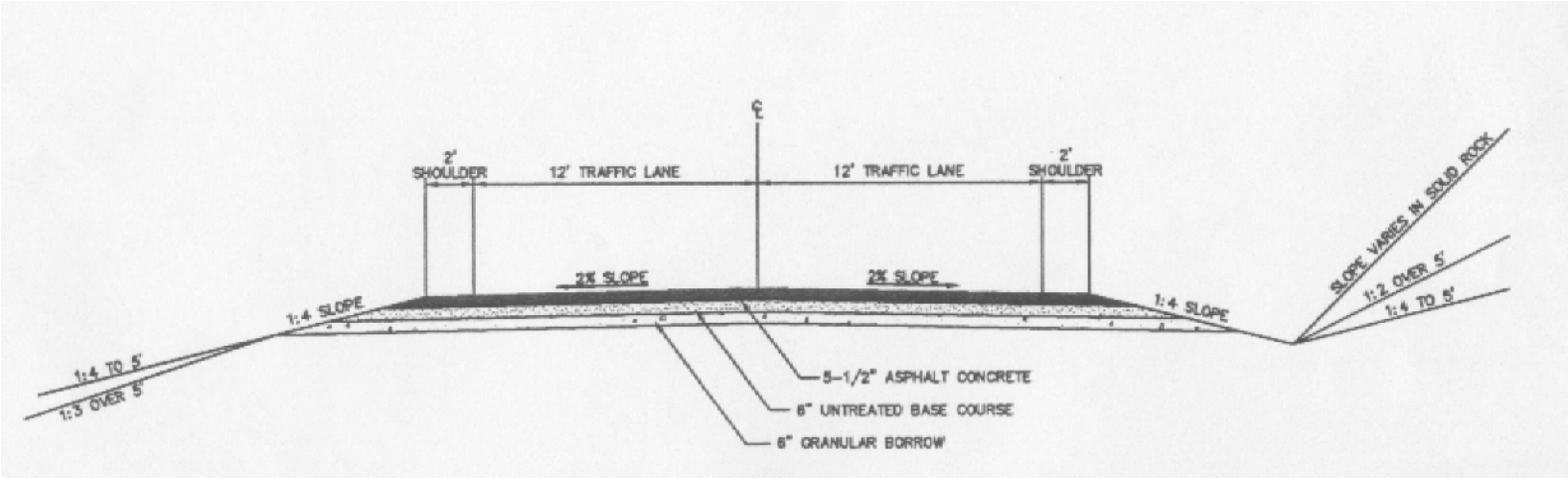
jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

Drawing Courtesy of Jones & DeMille Engineering

DATE DRAWN 6/13/03

REVISION

Quitchupah\PDESI\Figure 2-3.dwg




# QUITCHUPAH CREEK ROAD EIS

FIGURE 2-4
TYPICAL ROADBED SECTION
FOR SUITABLE SOILS

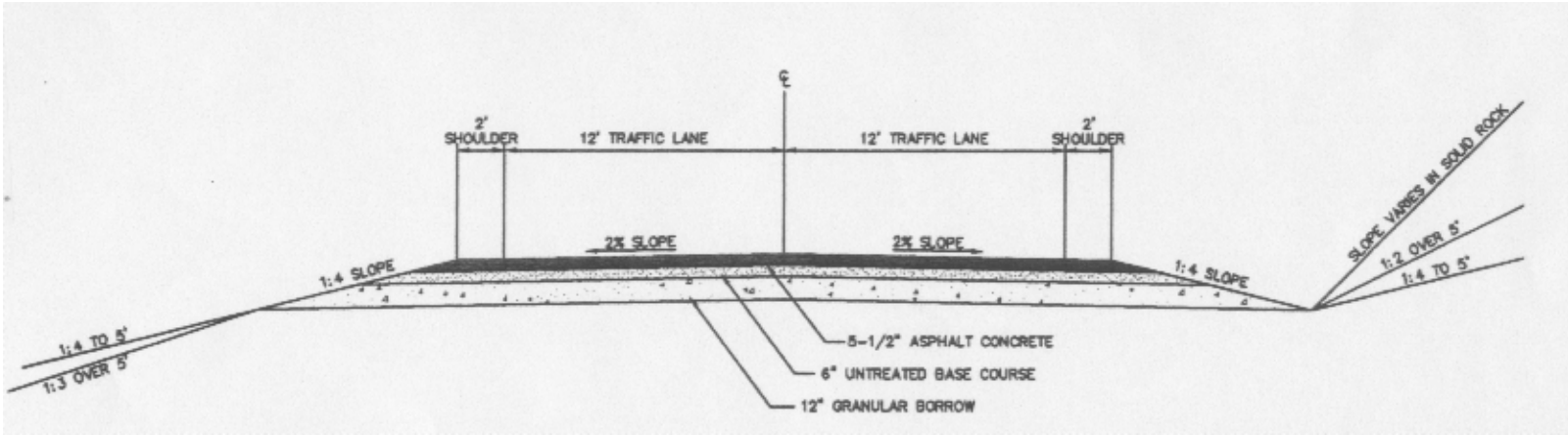
jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

Drawing Courtesy of Jones & DeMille Engineering

DATE DRAWN 6/25/01

REVISION

Quitchupah\PDESI\Figure 2-3.dwg




# QUITCHUPAH CREEK ROAD EIS

FIGURE 2-5
TYPICAL ROADBED SECTION
FOR UNSUITABLE SOILS

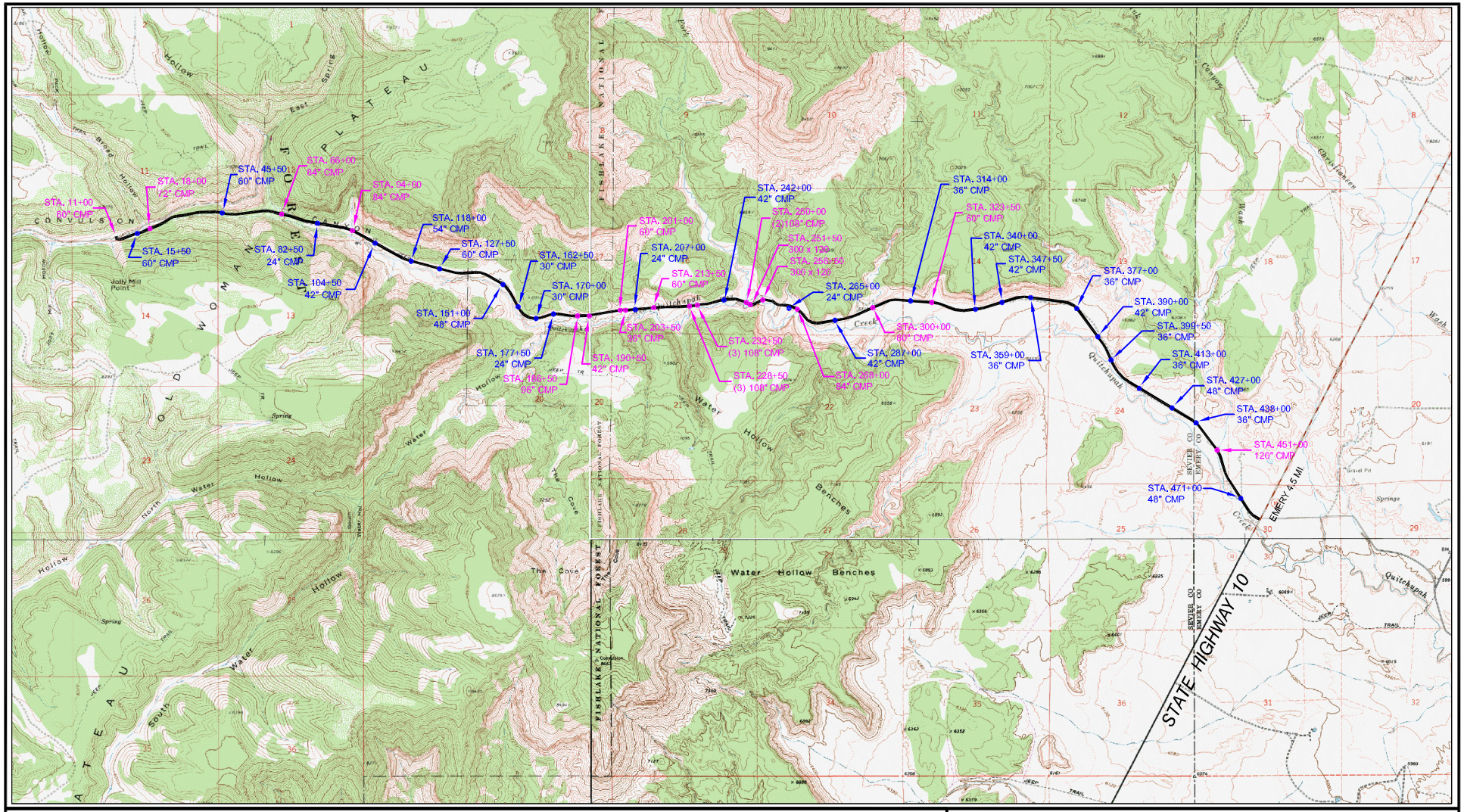
jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

Drawing Courtesy of Jones & DeMille Engineering

DATE DRAWN 6/25/01

REVISION

drawings\Quitchupah\deis 110305\Figure 2-6 9 12.dwg




EXPLANATION

QUITCHUPAH CREEK ROAD, ALTERNATIVE B

PRIMARY CULVERT CROSSING

SECONDARY CULVERT CROSSING

1 0 1 MILE

N

# QUITCHUPAH CREEK ROAD EIS

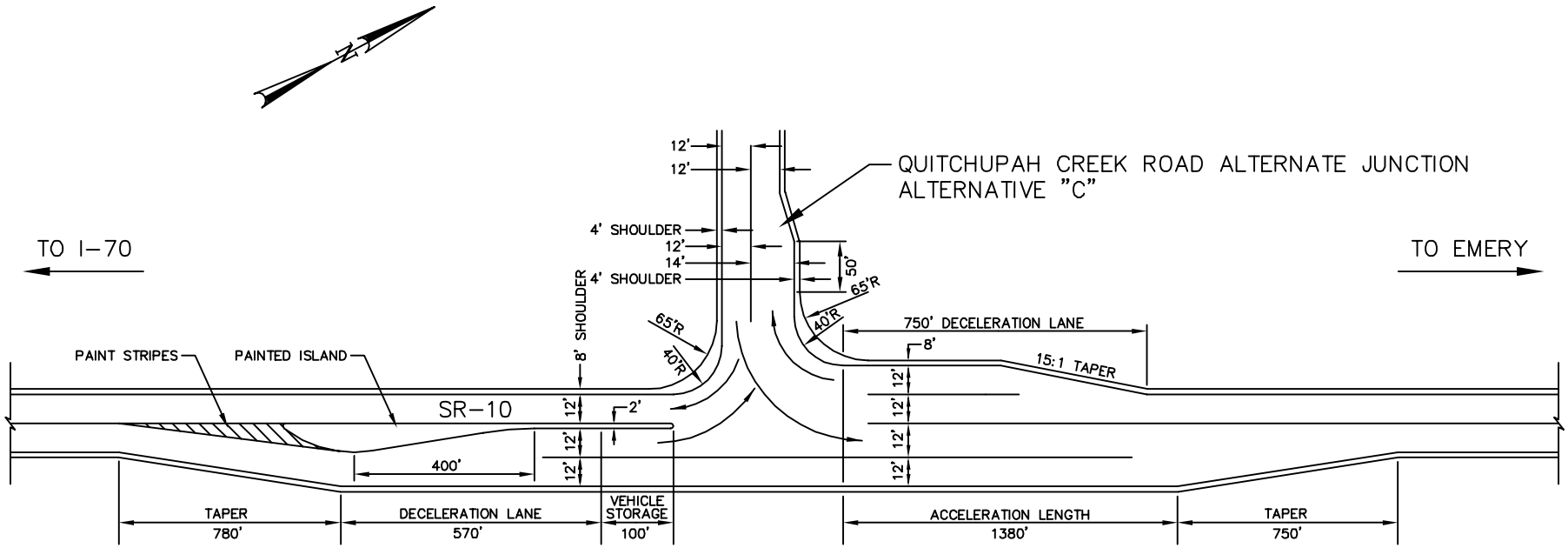
## FIGURE 2-6
## ALTERNATIVE B CULVERT LOCATIONS


jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada


Drawing Courtesy of Jones & DeMille Engineering

| | |
|---|---|
| DATE DRAWN | 7/02/02 |
| REVISION | 5/05/03 |
| | 6/13/03 |
| | 9/28/05 |

drawings\Quitchupah\deis 071405\Figure 2-3 7 11.dwg




# QUITCHUPAH CREEK ROAD EIS

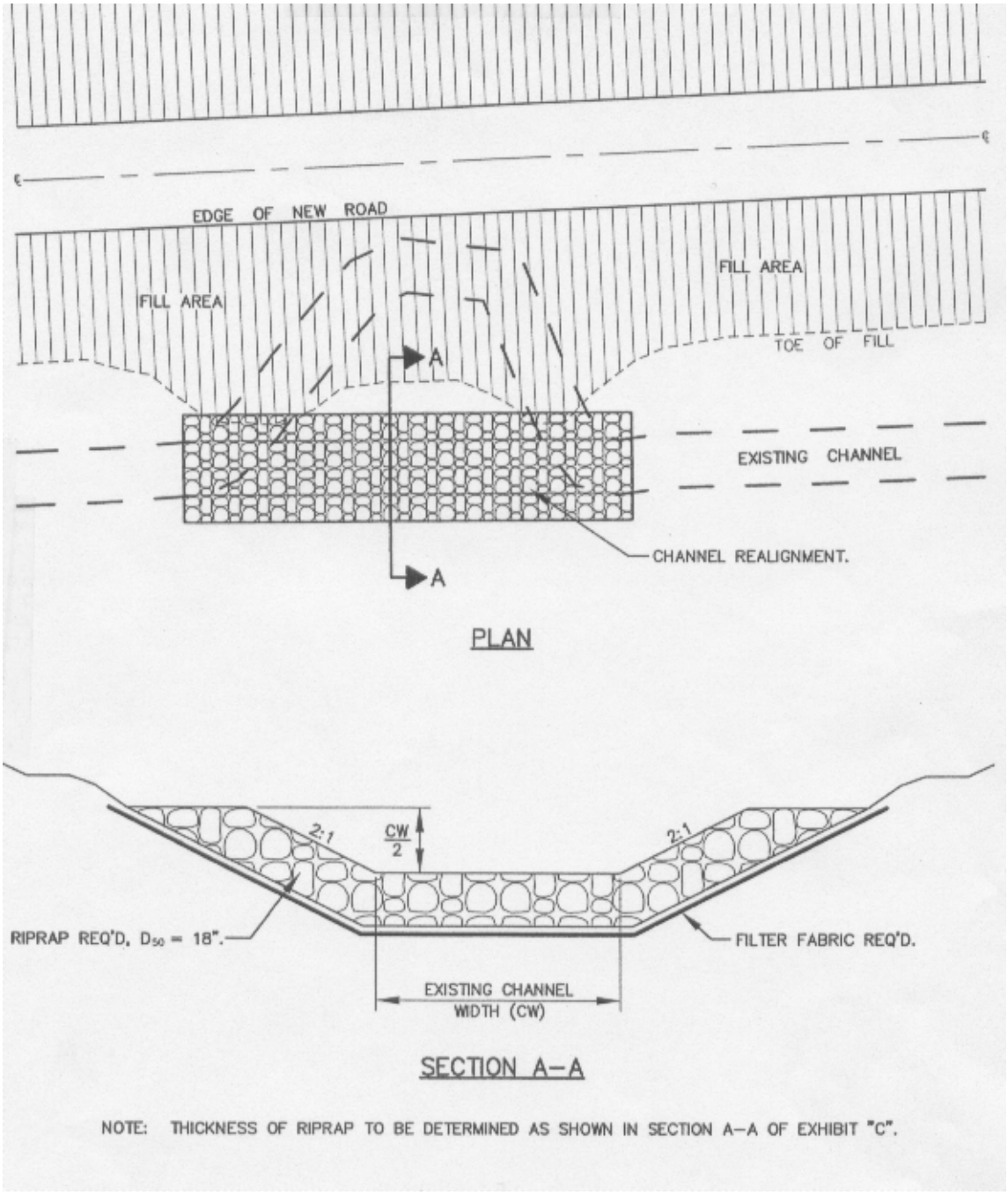
FIGURE 2-7
ALTERNATIVE C SR-10 JUNCTION

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

Drawing Courtesy of Jones & DeMille Engineering

DATE DRAWN 6/13/03

REVISION




# QUITCHUPAH CREEK ROAD EIS

FIGURE 2-8
TYPICAL CHANNEL REALIGNMENT

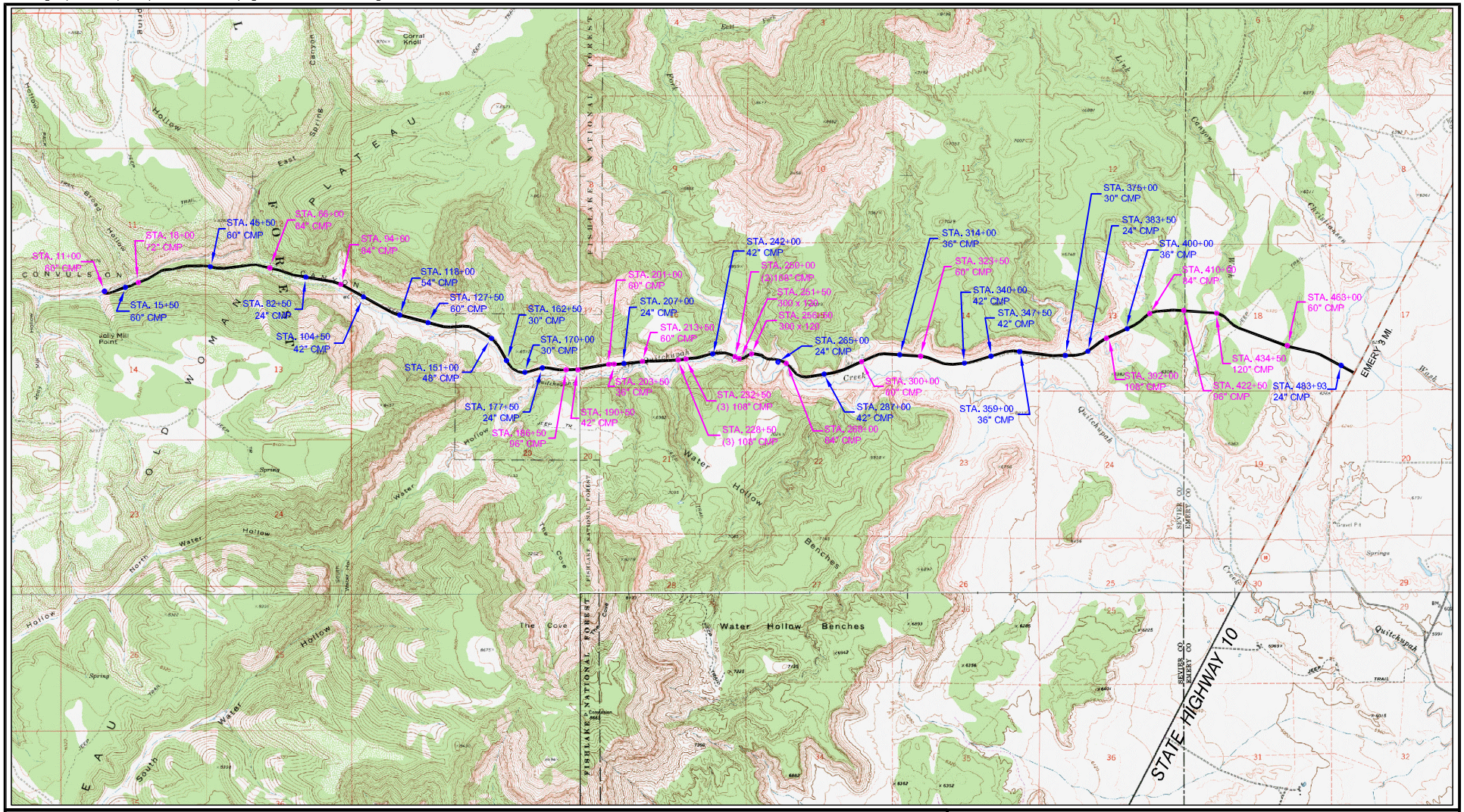
jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

Drawing Courtesy of Jones & DeMille Engineering

DATE DRAWN 6/25/01

REVISION

drawings\Quitchupah\deis 110305\Figure 2-6 9 12.dwg




EXPLANATION

ALTERNATE ROUTE, ALTERNATIVE C

PRIMARY CULVERT CROSSING

SECONDARY CULVERT CROSSING

1 0 1 MILE

N

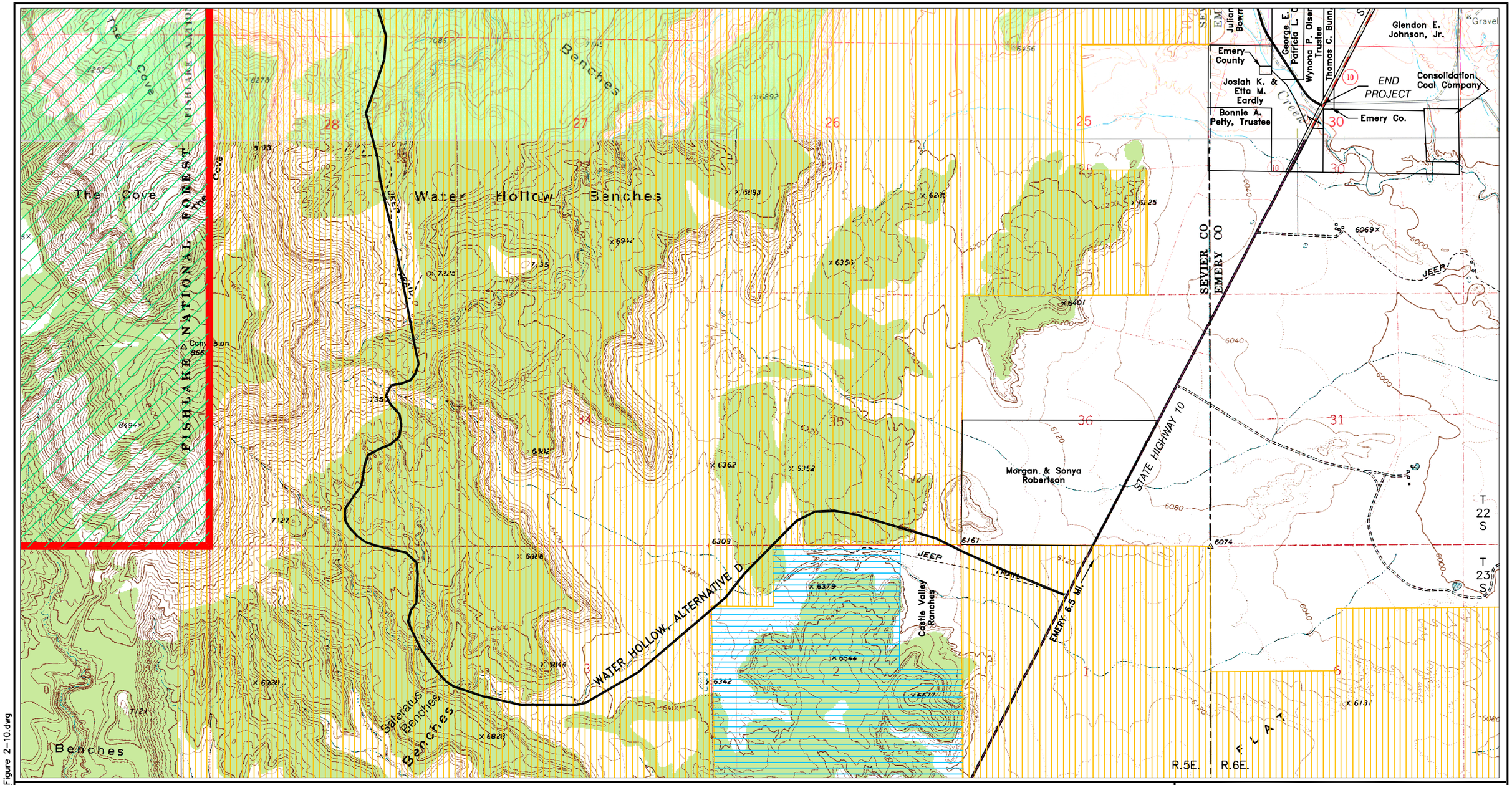
# QUITCHUPAH CREEK ROAD EIS

## FIGURE 2-9
## ALTERNATIVE C CULVERT LOCATIONS

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

Drawing Courtesy of Jones & DeMille Engineering

| | |
|---|---|
| DATE DRAWN | 7/02/02 |
| REVISION | 5/05/03 |
| | 6/13/03 |
| | 9/28/05 |




EXPLANATION

ROAD ALIGNMENT

OLD WOMAN RNA

EXPLANATION

LAND STATUS

FOREST SERVICE

STATE

BLM

PRIVATE

INDEX MAP

N

2000 0 2000 FEET

# QUITCHUPAH CREEK ROAD EIS

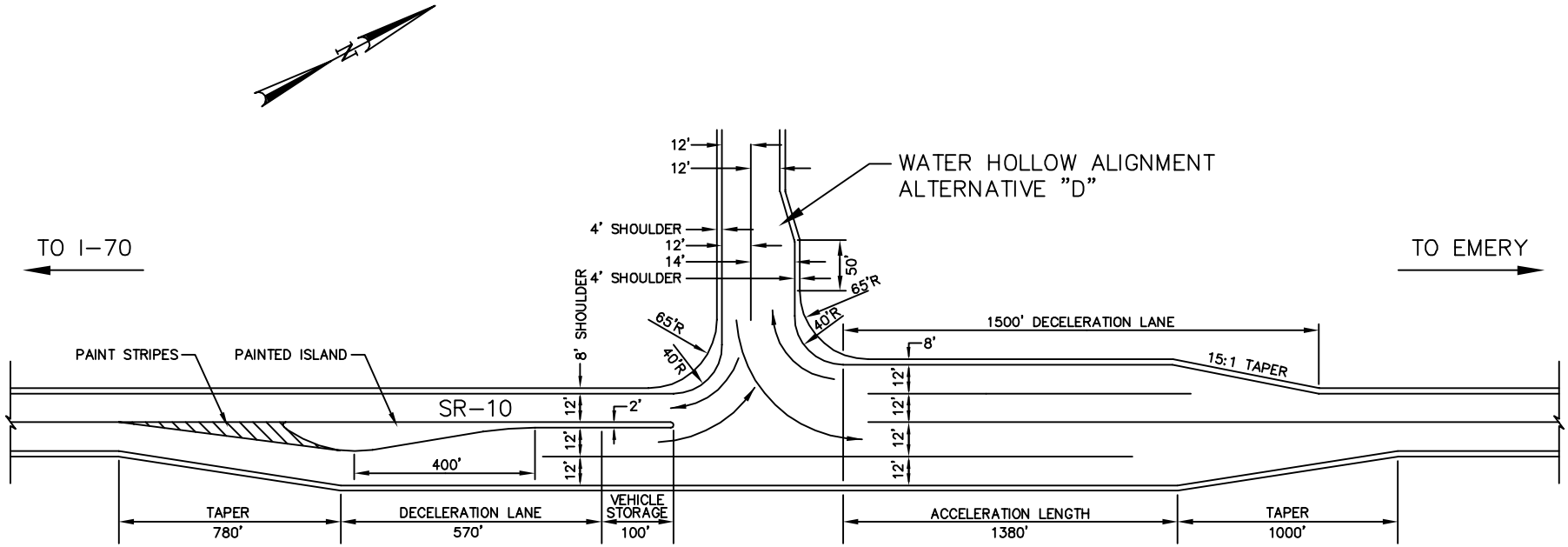
FIGURE 2–10
LAND STATUS AND OWNERSHIP MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE | DATE DRAWN | REVISION |
|---|---|---|---|---|---|
| KK | CP | | 1"=2000' | 6/30/01 | |
| | | | | 10/18/01 | |
| | | | | 6/13/03 | |
| | | | | 6/23/03 | |

drawings\QUITCHUPAH\deis 110305\Figure 2-10.dwg

drawings\Quitchupah\deis 110305\Figure 2-3 7 11.dwg




# QUITCHUPAH CREEK ROAD EIS

FIGURE 2-11
ALTERNATIVE D SR-10 JUNCTION

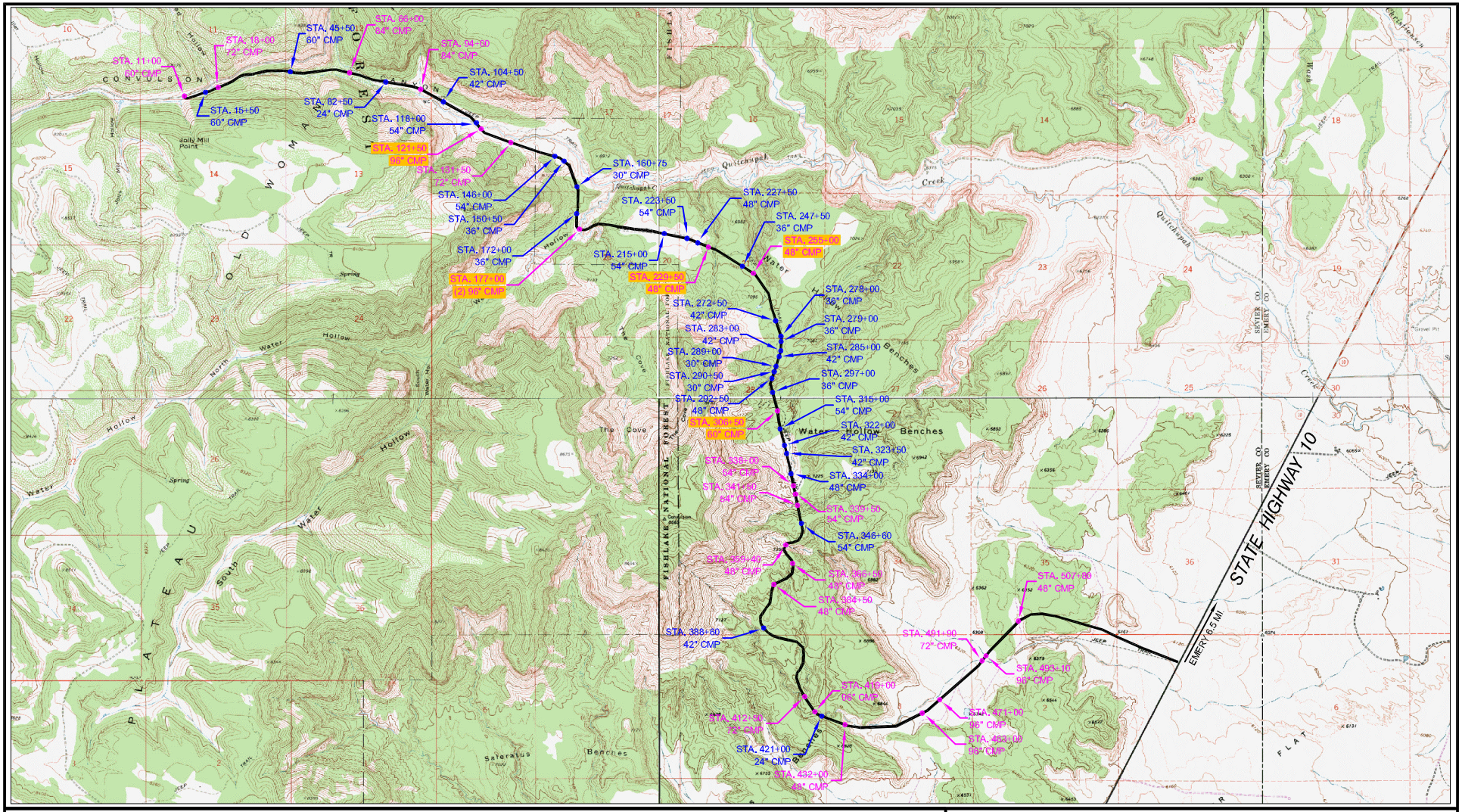
jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

Drawing Courtesy of Jones & DeMille Engineering

DATE DRAWN 6/13/03

REVISION

drawings\Quitchupah\Pdeis 110305\Figure 2-6 9 12.dwg




EXPLANATION

WATER HOLLOW, ALTERNATIVE D

PRIMARY CULVERT CROSSING

SECONDARY CULVERT CROSSING

RECOMMENDED WILDLIFE CROSSING

N

1 0 1 MILE

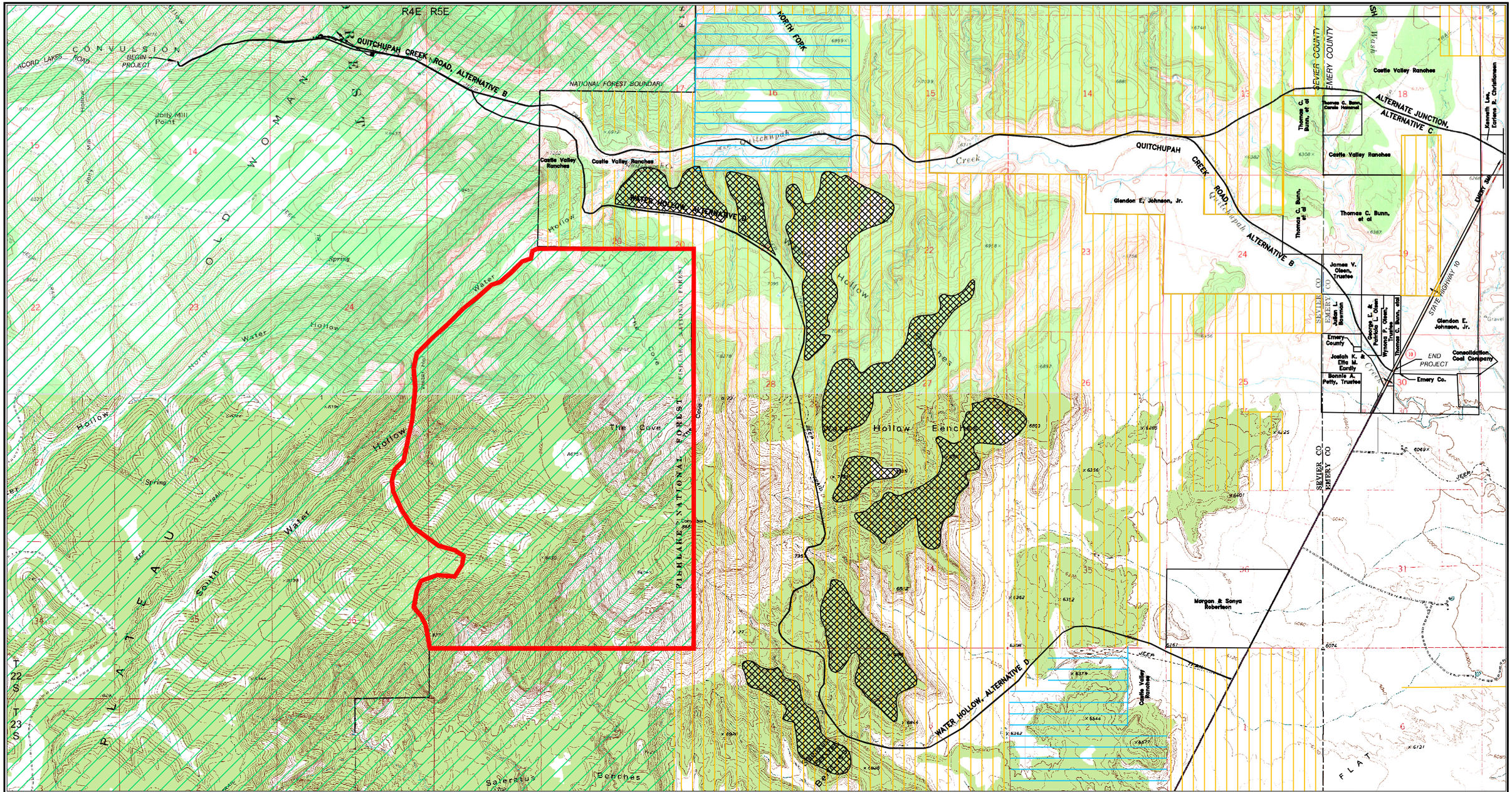
# QUITCHUPAH CREEK ROAD EIS

## FIGURE 2-12
## ALTERNATIVE D CULVERT LOCATIONS

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

Drawing Courtesy of Jones & DeMille Engineering

| DATE DRAWN | 7/02/02 |
|---|---|
| REVISION | 5/05/03 |
| | 6/13/03 |
| | 9/28/05 |




EXPLANATION

- ROAD ALIGNMENT
- OLD WOMAN RNA
- SEEDINGS

LAND STATUS

- FOREST SERVICE
- STATE
- BLM
- PRIVATE

N

3200 3200 FEET

# QUITCHUPAH CREEK ROAD EIS

FIGURE 2–13
ELK WINTER RANGE SEEDINGS

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE |
|---|---|---|---|
| JJ | CP | | 1"=3200' |

| REVISION | DATE DRAWN |
|---|---|
| | 4/22/02 |
| | 7/02/02 |
| | 11/15/02 |
| | 6/13/03 |

drawings\QUITCHUPAH\deis 110305\Figure 2-13.dwg

# Chapter 3

# Affected Environment and Environmental Consequences

# 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following sections describe the existing environment (Affected Environment), as presented by individual resource elements that would be affected by the Proposed Action and Alternatives; and the potential direct and indirect impacts (Environmental Consequences) of the proposed Quitchupah Creek Road. This chapter also evaluates direct and indirect impacts of the Alternatives to the Proposed Action that are designed to reduce or eliminate potential impacts resulting from the Proposed Action.

The BLM's NEPA Handbook (H-1790-1) requires that all EIS documents address certain Critical Elements of the Human Environment. The following Critical Elements are not present or are not affected by the Proposed Action or Alternatives and are not discussed in this EIS:

**Critical Elements of the Human Environment Not Carried Forward for Analysis in this EIS**

Hazardous or Solid Wastes:

No hazardous or solid waste concerns exist in the Project Area. The Proposed Road would not result in the introduction of hazardous wastes to the area. Further, all Project related solid waste would be disposed of properly.

Drinking Water/Groundwater Quality:

There are no drinking water sources in or near the Project Area watersheds, or downstream of the project, thus drinking water would not be impacted as a result of the Proposed Action or Alternatives. Only minimal, isolated occurrences of groundwater are expected to be intercepted during road construction (i.e. near wetlands and stream crossings) and construction methods would not affect the quality of this groundwater. Road usage would not affect groundwater.

Topography, Geology, and Minerals:

The road construction and operation would not affect overall topography or geology in the area. Changes to topography due to road cuts/fills and changes to exposed rock surfaces due to blasting in the road corridor would be localized. No mining claims are located in the immediate Project Area (BLM records). Each road alternative alignment follows canyon bottoms where locatable mineral deposits would not be economically feasible to mine. None of the authorized Federal oil and gas leases in the Project Area are currently active. The coal leases near the Project Area belong to Canyon Fuel Company, the owners of the SUFCO Mine. There are no other leases for minerals and no authorized disposal sites for saleable minerals, such as sand and gravel. Sand and gravel would be extracted for road construction from an existing aggregate borrow source located on private lands east of SR-10.

Air Quality:

The Clean Air Act Amendments, National Ambient Air Quality Standards (NAAQS), are health-based standards which serve to limit the concentrations of the following air pollutants: particulates less than 10 microns ($PM_{10}$); sulfur dioxide ($SO_2$); oxides of nitrogen ($NO_X$); carbon monoxide (CO); and volatile organic compounds (VOCs) (VOCs are regulated because they are a precursor of ozone). The Project Area is an attainment area for all NAAQS pollutants. No NAAQS would be impacted by the proposed project or alternatives. Additional Federal regulations, Prevention of Significant Deterioration (PSD), limit the degradation of air quality in any area which is attainment for NAAQS. Class II is the most common designation, which applies to the Project Area; this designation would not be impacted by the project. Although

vehicle traffic on the current road results in emissions of criteria pollutants, no standards would be affected by the project. A fugitive dust control plan would be required by the State of Utah to suppress particulate emissions during project implementation.

Noise:

The Project Area is generally characterized as rural or undeveloped. Ambient or background noise in the majority of the Project Area is typically natural outdoor and wildlife sounds. Additional noise at the west end of the Project Area results from mining and coal truck activity associated with the SUFCO Mine. The town of Emery, 3 miles northeast of the Project Area, can be characterized as a rural community. Local traffic and community activity are also noise sources associated with the town of Emery and are classified as ambient noise. Coal from the SUFCO Mine is currently transported through the town of Emery. The CONSOL Mine also transports coal along SR-10 and through Emery, utilizing a road which connects with SR-10 just north of Quitchupah Creek. There would be no additional coal transported in association with this project, and no additional noise in the vicinity of Emery.

Environmental Justice:

Under Executive Order 12898, each Federal Agency must identify and address disproportionately high and adverse human health or environmental effects of its programs on minority populations and low-income populations. There are no high or adverse human or environmental effects from implementation of the Alternatives, and no specific minority or low-income populations would be affected by the Alternatives; therefore, there are no impacts to environmental justice.

**Critical Elements of the Human Environment Carried Forward for Analysis**

The following Critical Elements are present within the Proposed Action area or may be affected by the Proposed Action or Alternatives, and are carried forward for analysis:

Water Resources and Floodplains - Section 3.2
Soils, including Prime or Unique Farmlands - Section 3.3
Vegetation and Wetlands, including Riparian Zones and Noxious Weeds - Section 3.4
Wildlife Resources - Section 3.5
Fisheries and Aquatic Resources - Section 3.6
Threatened, Endangered, and Sensitive Species - Section 3.7
Range Resources - Section 3.8
Land Use - Section 3.9
Visual, Recreation, and Wilderness - Section 3.10
Areas of Critical Environmental Concern and Wild and Scenic River Eligibility – Section 3.11
Cultural and Paleontological Resources - Section 3.12
Native American Concerns - Section 3.13
Transportation - Section 3.14
Socioeconomic Resources - Section 3.15

The construction and continued operation of the proposed road would result in **irreversible and irretrievable commitments of resources, residual adverse impacts, and cumulative effects**. These types of impacts are described below and addressed for each resource in the Affected Environment.

An **irretrievable commitment of a resource** includes use or consumption of a resource that is neither renewable nor recoverable for use by future generations. An example of this would be the mining and

extraction of coal reserves. An **irreversible commitment of a resource** is a primary or secondary impact that limits the future options for a resource. **Residual adverse impacts** are those effects remaining after implementation of mitigation measures. **Cumulative effects** result from the incremental effects of the Proposed Action or an action Alternative when combined with past, present, and reasonably foreseeable actions.

Implementation of the Proposed Action or Alternatives would cause resources to be consumed, committed, or lost during and after closure of the project. Lands committed to the right-of-way would be irreversibly lost to other uses as the proposed road would be a public road integrated into the public transportation system of Utah. There are no connected actions or other facilities to be built in conjunction with the proposed road.

The USFS and the BLM have reviewed all aspects of the Proposed Action (Alternative B - Quitchupah Creek Road Alignment) and the following Alternatives to the Proposed Action: Alternative A - No Action Alternative; Alternative C - Alternate Junction with SR-10 and Alternate Design of Quitchupah Route; Alternative D - Water Hollow Road. The review included applicant committed measures to avoid, minimize, and reduce adverse impacts to the environment.

## 3.1 Introduction

From a regional perspective, the Project Area is predominantly located within the Wasatch Plateau Subsection of the Basin and Range-Colorado Plateau Transition Physiographic Province (Stokes, 1986). The Wasatch Plateau is marked by gently rolling or near-flat surfaces on the plateau summits and stream cut canyons on the east flank of the Wasatch Plateau. Adjacent to the Wasatch Plateau, the eastern end of the Project Area is located within the Mancos Shale Lowlands Subsection of the Canyonlands Section of the Colorado Plateau Province. Topography in this Subsection is influenced by easily eroded sedimentary rock at the eastern base of the High Plateaus.

The topography of the area generally includes steep canyon walls, escarpments, and badlands. Flat ledges, vertical cliffs, and sloping erosional and depositional surfaces due to the differential erosion of interbedded shale and sandstones all contribute to the varied relief in the Project Area. Faulting and fracturing also affect the local topography. Topographic relief across the project site ranges from approximately 7,700 feet at the western boundary to 6,000 feet on the east.

All of the Alternative routes for the proposed project would descend from the southeast side of the Wasatch Plateau through canyons into Castle Valley.

Along the Quitchupah Creek Road alignment (Alternative B), most of the alluvial deposits are easily eroded fine sand to silts with minor coarse sand and gravel. The existing road in Quitchupah Creek canyon is subject to the effects of erosion, and at times becomes impassable due to washouts and deposition of alluvial debris on lowlands.

## 3.2 Water Resources

**Introduction**

The Project Area is located within the Colorado River Basin near the south end of the Wasatch Plateau. All drainage from the area flows to Quitchupah Creek or its tributaries, including East Spring Canyon, Water Hollow, and North Fork (See **Figure 3-1**). A 1,700-foot or more elevation difference between the upstream and downstream ends of the Project Area influences the flow regimes and fluvial morphology of

the streams within it. Precipitation ranges from averages of nine inches annually near the lower elevations of the Project Area to more than 20 inches annually near the top of the Plateau.

The upstream reach of the Quitchupah Creek stream channel, from the confluence with Water Hollow and continuing upstream, is known as Convulsion Canyon; flow in the highest elevation part of this upstream reach is intermittent, with perennial flow beginning in Convulsion Canyon near the wetland at about station 48+00. As it continues downstream, Quitchupah Creek receives significant amounts of flow from mine discharge into its North Fork, and from irrigation return flow near the eastern project boundary. The SUFCO Mine monitors flow rate and water quality on a quarterly basis at several sites along Quitchupah Creek. Flow rate varies seasonally, but the region's larger perennial streams, such as Quitchupah Creek, typically peak in May and June as a result of snow melt runoff. However, later summer thunderstorms can also produce extremely high flows for short time periods (Thiros and Cordy, 1991). Runoff events in the ephemeral watercourses that feed Quitchupah Creek most commonly occur in July, August, and September from intense thunderstorms. Salinity, as measured by total dissolved solids (TDS), and sulfates increase in a downstream direction in Quitchupah Creek, in part because of geologic changes. Quitchupah Creek is morphologically an active stream, and became entrenched early this century. It conveys high sediment loads, and receives sediments from both upland and in-channel sources. Quitchupah Creek provides water for irrigation and stock watering (water rights are discussed under a separate heading below).

Water Hollow flows into upper Quitchupah Creek from the southwest. It flows perennially, but no stream flow or water quality records are available. The Water Hollow Benches, south of Quitchupah Creek and east of Water Hollow, are dissected by numerous ephemerally flowing channels that drain primarily east and north. These ephemeral channels contribute to a high drainage density that results in extensive hydrologic connectivity of most parts of the watershed, and in turn results in high peak flows and rapid watershed response to intense thunderstorm events. This connectivity can have implications in regard to transfer of eroded materials from upland watershed areas to down-gradient receiving streams.

The headwaters of Quitchupah Creek are close to 9,000 feet above mean sea level (AMSL); at the western end of the proposed project, elevation of the creek is about 7,700 feet. Convulsion Canyon conveys flows from the Broad Hollow, Spring Hollow, and East Spring Canyon tributaries to Quitchupah Creek. These flows join with Water Hollow and the North Fork about midway through the Project Area. Numerous ephemeral channels are also tributary to Quitchupah Creek in the Project Area, including Link Canyon, which crosses the existing road near the eastern project boundary. To the south, the Water Hollow Benches area is drained by steep, entrenched, ephemerally flowing channels that trend primarily northeastward toward Quitchupah Creek. Elevation of Quitchupah Creek at the eastern project boundary is slightly more than 6,000 feet, and at that location, Quitchupah Creek drains an area of about 100 square miles.

**Stream Classification**

The approximately 2.5 miles of Convulsion Canyon and its tributaries, that are within the boundaries of the Fishlake National Forest, are categorized by the State of Utah as "Category 1 High Quality Water" as defined at R317-2-12.1 in the Utah Water Quality Standards. In general, the State's antidegradation policy calls for Category 1 waters to be maintained at their "existing high quality". However, "Projects such as.... roads will be considered where pollution will result only during the actual construction activity, and where best management practices will be employed to minimize pollution effects" (R317-2-3.2).

Downstream of the Project Area, and upstream of its confluence with Ivie Creek, Quitchupah Creek was listed on the State of Utah's 2004 303(d) list as a TDS-limited stream segment, which means that it did

not support its Class 4 (agriculture) beneficial use designation. (Other beneficial use classes applying to Quitchupah Creek are 2B (secondary contact recreation and aesthetics) and 3A (cold water aquatic wildlife); these uses are apparently supported under the existing water quality of the creek). The Department of Water Quality (DWQ), in its West Colorado Watershed Management Unit Water Quality Assessment Report (UDEQ, 2000), states that the probable sources for TDS in that stretch of Quitchupah Creek were natural and agricultural practices. The recently completed Total Maximum Daily Load (TMDL) (UDEQ, 2004) report for this area echoes that conclusion. As discussed further in the water quality section below, a new site-specific TDS standard has been approved by the State of Utah for Quitchupah Creek below SR10. That stream reach will effectively be removed from the 303(d) list once the proposed rule is formally adopted (UDEQ, 2005).

In addition, all tributaries to the Colorado River, including Quitchupah Creek are managed under the Colorado River Salinity Control Act. The goal of this act is to reduce sediment and salt loading in the Colorado River Basin.

**Stream Channel Descriptions**

Within the Fishlake National Forest, the upstream reaches of Convulsion Canyon/Quitchupah Creek and most of its tributaries are contained within narrow corridors between steep canyon walls. Functional flood plains in these upper reaches are essentially non-existent due to the canyon confinement, basin position, gradient, and flow regime. The stream-side areas where floods occur are not extensive, flat-surfaced overbank areas, nor do they possess extensive stream-lain alluvium, bar features, or other characteristics indicative of a functioning floodplain. Instead they are typically narrow extensions of the active channel where flood flows are conveyed within the confinement of the canyon walls.

Typically, once out of the confines of the canyons, these types of streams are generally freer to develop a floodplain. The extent of the floodplain depends in part upon the flow regime and the available material to construct the floodplain. At one time, Quitchupah Creek appears to have been a small, narrow stream with adjacent floodplains that supported homesteading and farming activities (Historical Committee of Emery, 1981).

Currently, Quitchupah Creek within much of the State of Utah, BLM, and private land areas is confined within a relatively narrow corridor between terraces, having vertically abandoned its historic floodplain. The stream was formerly at the surface of relatively thick, aggraded alluvium overlying the bedrock. But, as is typical of many streams in the region, it incised dramatically through that alluvium. This resulted in an entrenched channel with a new base level with banks 50 or more feet high. Much of that incision apparently occurred as a result of a single runoff event in 1912 (Historical Committee of Emery, 1981). The magnitude of the event was likely affected by the overgrazing that had occurred since the turn of the century. Since that time, a limited floodplain has formed and it functions between the incised banks. Field observations indicate that tributary channels have also been, and continue to be, undergoing rejuvenation to match this base elevation. In addition, the flashy, widely fluctuating stream flows, and the large amount of available sediments available for transport, make the possibility of Quitchupah Creek obtaining a true, dynamic equilibrium relatively unlikely without changes in land management (i.e. grazing) and the passage of time. Down-cutting and head-cutting through the terrace materials are still occurring, although apparently to a lesser degree than during the main period of incision. The terrace materials, barren and over-steepened, are also subject to significant sloughing and mass wasting into the channel. These areas are sensitive to alterations, including such outside influences as: removing the toe slope through meander adjustments; loading of top surfaces such as could occur with road construction; and locally modifying runoff that could cause piping and headcutting. The latter influences are currently occurring along the existing road.

These over-steepened terrace slopes, as well as other upland slopes at or near angle of repose, appear to be subject to periodic sloughing or other forms of mass wasting. Whether the result of head-cutting from the mainstem or side tributaries, piping due to runoff, rock toppling, or other mechanisms, alteration of the terrain on the small scale appears common and frequent in the general area. The existing road also appears to exacerbate this type of erosion as well.

Stream stability ratings have been described in the Final Water Resources Technical Report Quitchupah Creek Road EIS (JBR, 2001b) and provide information about the stability of Quitchupah Creek at this "newer" base level. Quitchupah Creek's stability generally decreases with distance downstream; the more stable reaches are those within national forest lands. No reaches were rated as excellent; the majority were within the fair range. In general though, the reaches show signs of recovery (as indicated by riparian vegetation growth) within the newer base level of the active stream. It is interesting to note that the three Quitchupah Creek aquatic sites (**Section 3.6** Fisheries & Aquatics) were generally rated more stable than the nearby reaches. The lower Water Hollow site had the second-best rating out of all locations studied. The implication of these ratings is that the already less stable reaches may be more susceptible to alterations in flow, sediment loading, or bank/bed manipulation by the installation of stream crossings or similar disturbances. Damage to the more stable reaches, although less likely, could still occur.

The median diameter of the bed particles (grain size) at the bed surface of each of the locations where the stream stability ratings were done indicates that the uppermost sites are generally sand and smaller sizes. The majority of the reaches were within the medium gravel sizes. These particle sizes would be readily moved as either suspended load or bedload during moderate runoff events.

The relative fineness of the bed particles reflects a stream system that conveys large quantities of sediments. Field observations during what appeared to be a fairly typical thunderstorm runoff event provide an indication of the level of sediments Quitchupah Creek conveys. While mapping channel features and collecting bed materials as part of the fisheries investigation (JBR, 2001c), an increase in bed deposits of approximately 0.75 feet vertical height was noted on the inside of a meander bed after a slightly more than bankfull flow event. The source of this material, while not known specifically, could easily have been from upland sources (tributary channels were observed to be running very turbid, overland flow was sediment laden), in-channel erosion of old terrace banks, or in-channel rearrangement of previously deposited sediments from further upstream channel bed, banks, or bars. Highly erodible soils are present throughout much of the watershed (JBR, 2001d) and provide upland sources of sediment. Past and current land uses, including grazing, have likely altered runoff and also contribute to high sediment yields in the watershed. In summary, there is no shortage of available, easily transported sediment sizes currently in the system, due either to natural sources or long term land uses.

**Flow Information**

Quitchupah Creek has been the subject of numerous studies where flow monitoring has occurred over recent years. Much of this data has been reported and analyzed by Mayo and Associates (1997).

Flow measurements near the upper end of Convulsion Canyon (Station 046 on **Figure 3-1**), made by Canyon Fuel Company on a quarterly schedule since 1983 (Canyon Fuel Company, 1999a), range from 0.01 cubic feet per second (cfs) to 0.52 cfs. Downstream from that location, flows from East Spring Canyon, a pump house that discharges excess water from a water well, discharge from a mine sediment pond in East Spring Canyon, and numerous small ephemeral tributaries can all contribute flow to Quitchupah Creek above its confluence with the North Fork. The channel in East Spring Canyon drains an area of about 8.5 square miles; Thiros and Cordy (1991) predict its average annual flow at about 1.8

cfs, and its 10-year peak at about 191 cfs. The SUFCO Mine (Canyon Fuel Company, 1999a) records of quarterly flow monitoring since 1983 show flows at the mouth of East Spring Canyon (Station 047A on **Figure 3-1**) ranging from 0.09 cfs to 1.1 cfs.

Observations of lower Water Hollow in winter 2000 indicated that, at least during those observed base flow conditions, this tributary to Quitchupah Creek supplies an amount of flow at least equal to the amount of flow in the main stem channel.

The North Fork is one of the primary tributaries to Quitchupah Creek. It is the receiving stream for the current Utah Pollutant Discharge Elimination System (UPDES) discharge point of about 1,000 to 1,500 gallons per minute (gpm) of groundwater intercepted from the existing SUFCO Mine. The discharge is essentially constant at that rate, and is anticipated to continue for at least the next several years. Generally, flow from the North Fork, including the mine discharge water, supplies about two-thirds to three-fourths of the flow in Quitchupah Creek at its confluence with the North Fork, according to Mayo and Associates (1997) and according to analysis of SUFCO mine water quality records submitted to the Utah Division of Oil, Gas and Mining.

Irrigation also affects flows in Quitchupah Creek and in the lowermost reach of Link Canyon. **Figure 3-1** shows two locations where canal diversions remove water from Quitchupah Creek on a seasonal basis. Further, field observations show that irrigation return flow from the Muddy Creek Canal enters both Link Canyon and Quitchupah Creek near the eastern project boundary.

Stream flows in the ephemeral channels that drain the Water Hollow Benches are not recorded, but can be expected to be erratic and flashy due to the nature of the precipitation events that produce them.

**Water Quality Information**

The Colorado River Basin Salinity Control Act, as amended in 1995, requires that USFS and BLM focus on minimizing salt contributions to the Colorado River from the lands that they administer. TDS concentrations are a measure of salinity. Specific conductance, and therefore, TDS varies seasonally within Quitchupah Creek (Thiros and Cordy, 1991). It also varies spatially, with a noted increase in a downstream direction. Both concentration and type of major ions change as the geology through which the flow passes changes, experiencing a dramatic difference as flow crosses the Mancos Shale area, noted for highly soluble salts. Mayo and Associates (1997) note that Quitchupah Creek begins to cross through Mancos Shale approximately one-half mile downstream of its confluence with the North Fork, and they further note that Mancos Shale is known "to greatly increase the TDS of creek waters". Thiros and Cordy (1991) state that:

> "The predominant chemical constituents found in surface water upstream from the lower part of the Blackhawk Formation in the Quitchupah Creek drainage area are calcium, magnesium, and bicarbonate plus carbonate. Surface water collected downstream, having flowed across the lower part of the Blackhawk Formation, Star Point Sandstone, and the upper part of the Mancos Shale, shows an increase in the concentration of sulfate."

In addition, analysis of water monitoring information obtain from the SUFCO mine and from the State of Utah's electronic data base (UDOGM, 2005) shows that on average, TDS increases from about 600 mg/l just below the confluence of the North Fork and Quitchupah to about 900 mg/l at the Highway 10 crossing. Using this same source of information, total TDS load in Quitchupah downstream of Highway 10 and the unnamed drainage encompassing Water Hollow and upstream of Christiansen Wash, averages about 7,900 tons/year. Based upon information from the recent TMDL report(UDEQ 2004), by far the

biggest nonpoint sources of TDS loading at this location are natural or ambient sources (about 1,800 tons/year), upland surface erosion (about 1,600 tons/year, and irrigation (about 900 tons/year). Smaller nonpoint sources would included existing roads and streambank erosion.

The noted TDS in the ranges in Quitchupah Creek, just above the confluence of the North Fork, apparently do not hinder the existing beneficial uses of stock watering and irrigation. Other designated beneficial uses of Quitchupah include secondary contact recreation and aesthetics and cold water aquatic wildlife; these uses do not have associated TDS standards.

The segment of Quitchupah Creek that is located immediately downstream of the Project Area is on the State of Utah's 2004 303(d) list as being water quality limited for TDS. This means that this stream segment is thought to be unable to support its agricultural beneficial uses due to elevated TDS levels. The State of Utah recently completed a Total Maximum Daily Load (TMDL) study for the portion of the West Colorado Watershed Management Unit that includes Quitchupah Creek (UDEQ 2004). The TMDL report concluded that, even with the successful implementation of recommended BMPs and waste load allocations, the agricultural TDS standard of 1,200 mg/l cannot be met in Quitchupah Creek. This is due to the large quantity of natural, ambient TDS sources that contributes to the overall salt load. Therefore, the State of Utah has approved the TMDL recommended change in the TDS standard in Quitchupah Creek, immediately downstream of the Project Area, to a site-specific limit of 2,600 mg/l. (The TDS standard in the upstream reaches of Quitchupah Creek, alongside the existing Quitchupah Creek Road, would remain at 1,200 mg/l.) This change in the standard will effectively remove Quitchupah Creek (UDEQ 2005) from the 303(d) list, although the 303(d) reports itself will not be generated again until 2006.

The DWQ has the regulatory authority for the Storm Water Discharge Permits that would be required for the proposed project; they would also have to provide 401 Water Quality Certifications for any wetland (Section 404) permits that the project would require. Further, the State Division of Water Rights would be required to ensure that any Stream Alteration Permits (SAP) they grant for road crossings would meet water quality certification requirements.

The existing water quality in Quitchupah Creek below its confluence with the North Fork is influenced by SUFCO's permitted release of mine discharge water, which apparently comprises the majority of the North Fork flow. This discharge averages about 4.3 cfs and represents about three-fourths of the flow in Quitchupah Creek below the Quitchupah/North Fork confluence. TDS at the mouth of the North Fork averages about 560 mg/l, based upon an average of three samples per year since 1983. TDS in Quitchupah Creek above the North Fork averages 680 mg/l, based upon a similar number of samples during the same time period. In effect, the mine discharge water serves to improve the natural water salinity at that location as measured by concentration; however total salt load is increased. SUFCO recently obtain a new UPDES discharge permit for this release, after DWQ performed a "Total Maximum Daily Load Analysis" (TMDL) to ensure that the receiving water quality and its beneficial use designations would be maintained. Since its flow generally contributes most of the flow in the North Fork, the average 560 mg/l TDS is well within the existing water quality standard of 1,200 mg/l for TDS for Class 4 uses for this upper reach of Quitchupah Creek, and within the new site-specific standard for the downstream reaches.

The aforementioned SUFCO Mine data do not include sediment analysis. However, suspended sediment data from various locations in the upper Quitchupah watershed show that area streams typically convey highly sediment-laden water during thunderstorm events; the Quitchupah Creek watershed seems particularly prone to this given the prevalence of highly erodible soils (JBR, 2001d).

While some of this sediment load may be from natural sources, geology, soil chemistry, climate, and especially historic land uses have exacerbated this. Grazing, instream cattle watering, slumping terraces, and the proximity of the existing, unstable Quitchupah Creek Road are all potential causes of increased sediment loading. Because some of the erodible watershed soils are also saline (JBR, 2001d), sources of sediment must also be considered as sources of TDS.

Data are not available for Water Hollow, but it likely has a similar water quality to upper Quitchupah Creek above the North Fork, given the similar geology through which it flows.

**Groundwater Resources**

As noted in the Final Geology Technical Report for this project (JBR, 2001e), the Quitchupah Creek Road alignment would be constructed primarily on Quaternary fluvial deposits and gravel terrace deposits adjacent to Quitchupah Creek. These unconsolidated alluvial and colluvial deposits are generally permeable, but are discontinuous and of varying thicknesses. Given these characteristics, they historically functioned as minor valley aquifers with rapid recharge and discharge capabilities, and were closely tied to streamflow, storm runoff, and precipitation patterns. Currently, much of the alluvium is separated vertically from Quitchupah Creek's active fluvial system (as a result of its incision). Once storing enough groundwater to enhance farming activities (Historical Committee of Emery, 1981), these abandoned floodplains now only function as terraces; these materials no longer represent a source of shallow groundwater.

Bedrock formations that are adjacent to (or are overlain by) the alluvial deposits through which all of the road Alternatives (B, C, and D) would cross are the lower Blackhawk Formation, Star Point Sandstone, and three members of the Mancos Shale Formation (the Masuk Shale, the Emery Sandstone, and the Blue Gate Shale). These formations consist of interbedded horizons of varying thicknesses of sandstone, siltstone, mudstone, and shales. The coarser of these horizons support groundwater, while the more impermeable, finer beds impede its vertical movement and redirect its horizontal flow. Movement and discharge of groundwater is stratigraphically controlled by these interbedded layers and by secondary permeability via faults and fractures. Recharge areas are spatially limited. For these reasons, as demonstrated by others (Mayo and Associates, 1997; Thiros and Cordy, 1991), groundwater in the general vicinity of the Project Area is typically localized within small, perched zones, and is inactive. Consequently, the Project Area does not overlie any regional aquifers capable of supporting significant water usage.

**Water Rights**

Information from the Utah State Engineers' office indicates that there are numerous water rights held in the vicinity of all of the alternate road alignments. A listing of water rights was presented in the Water Resources Technical Report prepared for this project (JBR Environmental Consultants, Inc. 2001b). The majority of these are rights for stock watering directly on Quitchupah Creek, Water Hollow, and their ephemeral tributaries. In fact, essentially all water courses, both perennial and ephemeral, within the Project Area are subject to these in-channel stock watering rights. Typically, these surface water rights for stock water do not give specific quantities of water; instead, they specify a stream reach and duration whereupon a given number of livestock may drink.

Two points of diversion of irrigation water from the creek are also located near the proposed road upgrade, as shown on **Figure 3-1**. The quantity of water associated with the upstream diversion is four cubic feet per second (cfs).

## Environmental Consequences To Water Resources

The Environmental Consequences of each Alternative, in regard to water resources, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

### REGULATORY

#### NO ACTION - ALTERNATIVE A

There would be no change to the current state of water resources and existing influences on it as a result of the No Action Alternative in regard to regulatory impacts. No Stream Alteration Permits would be needed under this Alternative. There would be no change in water quality as a result of No Action that would have implications in regard to the State's High Quality Water category for the streams on national forest lands. There would be no change in water quality as a result of No Action that would have implications in regard to the State's 303(d) listing – or its de-listing - for Quitchupah Creek downstream of the Project Area. However, existing sources of accelerated erosion would continue to affect the High Quality Water and 303(d) reaches of Quitchupah. Further, there would be no potential to impact the regulatory issues of water rights or floodplains, should the No Action Alternative be chosen.

#### QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B

The Army Corps of Engineers (COE) requires that individual federal permits be obtained for all dredge and fill activities taking place within the nation's waters ("Waters of the U.S."). Waters of the U.S. include all wetlands, defined by saturated soils and the presence of obligate wetland plants, as well as all waters having a current or past use in interstate or foreign commerce. A General Permit for Storm Water Discharges would need to be obtained during construction activities as well as numerous approvals for work in Waters of the U.S. For this project, the COE has indicated that it would take the lead for all of the wetland and Waters of the U.S. permitting so that Stream Alteration Permits from the State would not be needed. Other state regulatory considerations would be related to Utah water quality designations of High Quality Category I waters on national forest lands and 303(d) listed waters downstream of the Project Area. As noted in **Section 3.4**, the reaches of Quitchupah Creek that are on the current 303(d) list are likely to be removed during the 2006 cycle due to completion of the TMDL and enactment of a greater site-specific TDS standard. Lastly, floodplains and existing water rights would also be regulatory issues, discussed in more detail under the Potential Impacts section (below).

#### ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C

Regulatory impacts would generally be the same as for Alternative B.

#### WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D

Regulatory impacts would generally be the same as for Alternative B.

## Potential Impacts To Water Resources

The proposed road would be engineered to meet AASHTO standards, in order to ensure its long-term stability. BMPs that would be required under any of the build Alternatives would further help to ensure that impacts related to sediment, salinity, erosion, drainage crossings, and other water quality and quantity impacts would be reduced as much as possible. These BMPS are mentioned throughout Chapter 2 and are contained in total in **Appendix B**; they include construction, operation, and maintenance aspects of the proposed road project. The elimination of livestock grazing from 4.7 miles of the riparian corridor within the public land stretches of Quitchupah Creek would eventually benefit the stream ecosystem.

The high level of expected use of this toll road means that the proponents have a large stake in seeing that the road remains driveable at all times, at least during the initial years while the mine is still operating.

Culvert failure, fill erosion, or even a temporary ditch/culvert overflow situation could easily render the road impassable, thus, halting traffic and becoming an unacceptable situation for economic reasons. Therefore, engineering designs that include specific measures for a high degree of water and sediment management have minimized the potential for these types of failures. Further, the monitoring and inspection procedures that would be adopted along with each of the build Alternatives would result in rapid identification of problems and ensure their timely correction. While the proponents' primary interest in keeping the road passable may be economic, the resultant effect is that water-caused damage that introduces sediments to the stream system would also be minimized by those same design, BMP, monitoring, and maintenance features. These considerations are taken into account in the impacts assessments for each Alternative.

The fact that an existing road is in place and is currently in poor condition is also relevant to this analysis of Alternatives. The existing road is a source of sediment and runoff alteration, and it receives little or no maintenance. Under Alternative B, all but about one mile of this existing road would be obliterated or reclaimed. Under Alternative C, all but about 3.7 miles of the existing road would be obliterated or reclaimed. Under Alternative D, approximately 7 miles of the existing road's 9.15 mile length would remain unreclaimed, minimally maintained, and in use.

Lastly, predicted impacts are based upon detailed road designs, BMPs, construction techniques, reclamation, aggressive monitoring, timely maintenance schedules, and other environmental commitments as provided in Chapter 2, **Appendix B**, and the Monitoring Plan. **Appendix D** includes discussions on other foreseeable actions upon which cumulative impact analysis is based.

### NO ACTION - ALTERNATIVE A

There would be no change to the current state of water resources and existing influences on it as a result of the No Action Alternative. The existing road alongside Quitchupah Creek crosses erodible soils, is in close proximity to the stream for much of its length, and relies upon the native unconsolidated terrace deposits for much of its substrate. As a result, it currently adds sediment to the stream. Under No Action, Quitchupah Creek would continue to convey sediments at occasionally high concentrations, the existing road would continue to be a source of sediment to the stream, and the stream would, at least in the near-term, continue to be susceptible to destabilization. The salinity of the stream would also continue to be influenced by sedimentation due to the erosion of saline soils. The existing road would remain in place and in use, and the existing 16 primary watercourse crossings (8 perennial and 8 ephemeral) would remain as fords (or culvert, in the case of the East Spring Canyon crossing). Most of the perennial stream fords appear to be fairly stable; many of the ephemeral fords appear to be subject to failure through headcutting, piping, and down-road diversion. Maintenance does not appear to be frequent or very successful along the existing road, which is inconsistent with BMPs for pollutant sources under the Clean Water Act. At times, these existing crossing problems, as well as other road drainage problems, cause the existing road to be impassable. This would be expected to continue in the future under the No Action Alternative.

### QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B

#### Stream Crossing Impacts

The proposed Quitchupah Creek Road alignment would require 18 primary watercourse crossings and 25 secondary crossings. Six primary crossings of perennial waters would be required: 4 culverted Quitchupah Creek crossings; 1 culverted crossing at East Spring Canyon; and 1 culverted crossing at North Fork. Two additional primary crossings would be required at the upper end of Convulsion Canyon, which flows intermittently. Ten defined ephemeral wash primary crossings would be needed, including at Link Canyon. These make up the afore-mentioned 18 primary crossings. The remaining secondary crossings would be ephemerally flowing minor channel or swale crossings.

As noted above, the existing Quitchupah Creek road already has a total of 16 primary crossings (8 perennial and 8 ephemeral); all of those crossings would be either replaced with culverts on the new road, or abandoned and reclaimed where the new road diverges from the existing road. Therefore, the net increase in number of primary crossings would be two (18-16). **Table 3.2-1** shows the number of primary crossings on the existing Quitchupah Creek road alignment, the number required for this Alternative, and the net based upon whether the existing primary road crossings would remain or be replaced/removed.

All crossing culverts (both primary and secondary) would be designed to pass the 100-year peak flow, as well as associated sediment and debris. In addition, as described in Chapter 2 and in **Section 3.5**, several of these culverts would be designed (based on input from the Utah Division of Wildlife Resources) so that fish passage would not be hindered. Various other BMPs that would be applied to culverted crossing during construction and operation are described in **Appendix B**; these would reduce impact potential from culverts during the design flow and during more regular flows.

**Table 3.2-1 Primary Watercourse Crossings - Alternative B: Proposed Quitchupah Creek Road**

| Stream Regime | Alternative A Existing Quitchupah Creek Road (denotes primary crossings that are currently in place) | Alternative B Proposed Quitchupah Creek Road (denotes number of primary crossings placed during construction of new road) | Existing Primary Crossings that would be removed or replaced during construction | Net number of Primary Crossings after construction of new road and removal of existing road |
|---|---|---|---|---|
| Perennial | 8 | 6 | 8 | 6 |
| Intermittent | 0 | 2 | 0 | 2 |
| Ephemeral | 8 | 10 | 8 | 10 |
| Total | 16 | 18 | 16 | 18 |

Note that all but one of the existing primary crossings on the existing Quitchupah Creek Road are fords; the only culvert that is currently in place is at the East Spring Canyon Crossing. As discussed above under the No Action Alternative, most of the existing perennial stream fords appear to be relatively stable, in contrast with many of the ephemeral wash crossings, where erosion and runoff problems are often apparent.

**Table 3.2-2** provides measurements made in the field at selected larger crossings associated with Alternative B. Most of these are designated primary crossings; the majority of secondary crossings would not affect waters of the U.S. The volume per foot column represents the approximate volume of defined waters (under or stream-ward of the Ordinary High Water Mark (OHWM)) per foot through the width of the crossing that would be filled either by the culvert itself or associated back fill. The total volume of fill associated with each crossing would be greater than the amount that is relevant to the Stream Alteration Permit; there would also be fill associated with each crossing that is placed above the elevation of the OHWM to up to the roadbed elevation. The total volume of fill at each crossing would be indicative of sediment levels that could be contributed to the stream should the crossing fail entirely.

**Table 3.2-2 Waters of the U.S. or State at Selected Crossings - Alternative B Quitchupah Creek Road**

| Station | OHWM Width (inches) | OHWM Depth (inches) | Volume per Foot below OHWM (cu. ft.) | Fill Length (feet) | Channel Description |
|---|---|---|---|---|---|
| 11+00 | 30 | 6 | 1.25 | 60 | Intermittent Section of Quitchupah Creek |
| 18+00 | 30 | 6 | 1.25 | 180 | Intermittent Section of Quitchupah Creek |
| 66+00 | 40 | 11 | 3.06 | 170 | East Spring Canyon (perennial) |
| 94+00 | 40/23 | 2 | 0.44 | 200 | ephemeral tributary |
| 186+50 | 52/42 | 6 | 1.95 | 350 | ephemeral tributary |
| 201+00 | 33/21 | 8 | 1.60 | 250 | ephemeral tributary |
| 213+50 | 32/21 | 8 | 1.50 | 250 | ephemeral tributary |
| 228+50 | 108/48 | 18 | 9.75 | 210 | Quitchupah Creek (perennial) |
| 232+50 | 108/48 | 18 | 9.75 | 250 | Quitchupah Creek (perennial) |
| 250+00 | 156/72 | 30 | 23.75 | 80 | North Fork (perennial) |
| 251+50 | 166 | 18 | 20.75 | 130 | Quitchupah Creek (perennial) |
| 256+50 | 166 | 18 | 20.75 | 80 | Quitchupah Creek (perennial) |
| 271+00 | 102/78 | 10 | 6.25 | 200 | ephemeral tributary |
| 268+00 | 57/48 | 5 | 1.82 | 90 | ephemeral tributary |
| 451+00 | 114/97 | 12 | 8.79 | 250 | Link Canyon (ephemeral) |

The risk associated with these culvert installations, defined here as the likelihood that culvert capacity will be exceeded, can be quantified by using the recurrence interval of the design flow and the assumed design life of the project. For all proposed primary and secondary culverts on the Quitchupah Creek Road, the former is 100 years and the latter is assumed to be 20 years. Applying the formula given below, the probability of failure is thus 18 percent that culvert capacity would be exceeded, or, conversely, 82 percent that it wouldn't be exceeded. Although there would be a one percent chance of exceedance in any given year, the probability of failure over 20 years would be 18 percent. (As will be seen in the sections discussing Alternatives C and D, because design recurrence interval and design life are the same for all of the build Alternatives, all have an equivalent calculated probability of failure.)

$$P_n = 1-((T_r-1)/T_r)^n$$

where:
$P_n$ = probability of occurrence
$T_r$ = recurrence interval in years
n = design life in years

Should capacity of a given culvert be exceeded, it may or may not fail or be completely washed out. However, assuming a total wash-out of all fill material placed in association with the culverts, a comparison of the consequences of accepting the 18 percent risk among the various build Alternatives can be based upon the total approximate volume of fill at all crossings for a given Alternative. Because this does not in any way imply that these actual total quantities of materials would enter a stream system, either over time or in one instance, volumes are not given here. Instead, Alternative B is given a ranking of 1, and the other Alternatives are compared to this ratio. Alternative A has minimal existing road fills and would have no new construction fills. As such, Alternative A ratio is >0 and <1. As will be seen in the discussions of Alternatives C and D, Alternative B has the lowest ranking of any of the build Alternatives.

The perennial stream reaches where most of the primary culverted crossings would occur are located in the western half of the Project Area. The Phankuch (1978) method of stability rating was used in analysis and these "procedures were developed to systemize measurements and evaluations of the resistive capacity of mountain stream channels to the detachment of bed and bank materials and to provide information about the capacity of the streams to adjust and recover from potential changes in flow and/or increases in sediment production." These reaches coincide with areas of the stream that were rated better in the Phankuch stability rating than the eastern reaches, where no perennial and few other primary watercourse crossings would be required. The better Phankuch rating, in general, means that these reaches should adapt better to presence of the culvert than a lower reach with poorer stability. However, even in these more adaptable reaches, proper design, placement, and maintenance would be key to ensuring that these reaches maintain their current stability. The upstream reaches also, in general, convey less sediment, so sediment plugging would be less likely to occur in these culverts. (Note that westernmost reach of stream - which received the highest Phankuch rating - would be obliterated by the road alignment and replaced essentially by a road ditch; in this case, the resiliency and adaptability of the original channel, as described by its rating, has no bearing on the future stability or instability of the replacement conveyance.)

Commonly, culverted crossings, and other road drainage features, serve to extend the drainage network and result in higher local runoff rates and volumes. However, crossing and road drainage BMPs given in Chapter 2 and **Appendix B** would function to reduce those potential effects.

Lastly, in regard to the fact that perennial crossings would only be required in the upper reaches, is the issue of fish passage. As described in the Aquatics Technical Report (JBR, 2001c), few fish were found in the upper reaches, both in number and in diversity. In order to not further contribute to reduced number, where fish were found during baseline surveys, culvert passage (either meaning sufficient depth during low flows or reduced velocities during high flows) would be provided for in the final design phase based upon the fish species present and their specific seasonal requirements as determined through consultation with the Utah Division of Wildlife Resources. This is discussed further in **Section 3.5**.

The existing Quitchupah Creek bridge on SR-10 near the terminus of the alignment would need to be widened 8 feet to the west and 32 feet to the east, almost doubling its current width, and the COE 404 issues would have to be considered as part of that activity.

**Realignment/Floodplain Impacts**

Primarily in the upstream reaches of the project, some areas of overbank or floodplain fill would also be associated with the culvert crossings, as well as with stream impingement in the Convulsion Canyon, East Spring Canyon, and Rock Art realignment areas, and with reaches along Quitchupah Creek where the

road toe may infringe on a channel meander bend. Avoidance of all impingement or realignment is not feasible given the topographic constraints. However, filling of such areas will be avoided to the extent possible, and would be restricted to areas directly associated with the required road alignment where needed due to topographic constraints. As described in Chapter 2 and in **Appendix B**, the realigned channels and reaches where the road fills toe out in or close to stream channels, would be designed to minimize the potential for redirecting flows and stream energy to opposite banks, instigating bed/bank scour. Any wetlands associated with these areas would be properly dealt with through the COE 404 permitting process as described in the Vegetation Technical Report (JBR, 2001k) and in Section 3.6.

These upstream overbank areas may not be floodplains in the morphological sense of an extensive alluvial overbank area subject to frequent reworking by stream flows; however, they may be considered floodplains in a regulatory sense. The existing so-called floodplain areas do not function as a morphological floodplain feature more typical in the downstream valley areas (there are not extensive alluvial deposits that retain flood flows, hold overbank water for riparian uses, or reduce flood peaks), therefore impacts to these flood plains would be expected to be negligible in the upstream reaches where realignment is proposed, not withstanding the fact that during realignment, the active and overbank channels would be obliterated. In the downstream valley area on the eastern half of the project, there are few if any encroachments due to the road alignment and design, however potential impacts due to redirecting flows would also be minimized through the stated BMPs and design features should these encroachments occur. Impacts due to realignment of the Convulsion Canyon and East Spring Canyon reaches are discussed below.

The approximately 2,800 feet (from road stations 13+50 to 15+50 and 19+00 to 45+00) of Convulsion Canyon channel that would require realignment flows intermittently. These reaches are currently confined between the steep canyon slope on one side and the existing Quitchupah Creek road on the other side. Gradient is currently approximately 7.5 percent, with very little meandering. The cross section of the bed is generally flat and contains riparian vegetation; the banks are steep and oversteepened with sloughing present in areas. The single Phankuch stability rating done within this segment had the highest rating of any along the Project Area (however, given the intermittent nature of the stream in this location it was not well suited to the methodology).

Given the topographic constraints, the realigned segment would be straightened to a grade of approximately 9 percent, and would likely be more ditch-like, and have a narrower, more uniform channel bottom that the existing channel has. (During final design for this section, slight meanders may be placed should topography allow; however initial designs indicate this would not be possible, therefore impact analysis assumes the same.) To accommodate the higher velocities associated with new cross section and profile, an engineered channel, using a combination of riprap, grade control, and/or vegetation, would be placed to maintain stability. There would be a loss of riparian vegetation (see Vegetation Impacts Section), and erosion of the intercepted steep natural slope would likely contribute sediments to the channel in this location. The resiliency of this stream reach as inferred by the high Phankuch rating would be lost as the reach is replaced by a more ditch-like channel. Where appropriate, the BMPs listed in **Appendix B** would be used to minimize this potential for erosion/sediment impacts. Transitional treatments would be done to ensure that, at the downstream end of the realigned reach, velocities and flow area are returned to their original conditions, as described in **Appendix B**. Some of the sediments contributed by this reach would eventually be trapped within the wetland mitigation area immediately downstream of the realigned reach.

Approximately 1,100 feet (between 65+00 and 75+00) of East Spring Canyon that would be filled and require realignment flows perennially. Because the topographic constraints are not as overwhelming in

this area as on the Convulsion Canyon realignment, a more naturally functioning stream can be designed as described in Chapter 2. After an initial period of adjustment, this stream realignment would not be expected to be impacted or impact adjacent stream reaches.

A portion of an existing meander and cutoff channel, that recently diverted the stream from its former course through a meander bend in Quitchupah creek just upstream of the original junction with North Fork, would be shortened 130 feet in order to accommodate the road fill. This would occur between stations 249+00 to 250+00. Since the cutoff of the meander is a recent event, the remaining dry portion of the meander still retains an unobstructed channel downstream to the original junction with North Fork. The north curve of the meander where the cutoff channel is located would be filled and the meander shortened slightly due to the fill. The diversion of 130 feet of the stream from the cutoff back into the meander would restore about 350 feet of the stream channel and decrease the grade from 7.6 percent to 2.3 percent (Strip Map 9).This realignment would be designed to maintain velocities and bed elevations. After an initial period of adjustment, it would not be expected to cause stream instability. The planned monitoring would insure that unforeseen impacts would be corrected.

**Erosion, Sedimentation and Salinity Impacts**

Road construction and related ground disturbing activities can often cause accelerated erosion and introduction of sediment into stream channels. Given the geologic environment of the Project Area, introduction of sediments also results in introduction of salts (dissolved solids). Various types of erosion and sediment controls, described as BMPs in **Appendix B**, would be implemented in order to maintain water quality during and immediately after construction. These controls include such structures as silt fences, and such practices as limiting the areas for construction activities. When properly implemented, such techniques can dramatically reduce potential sediment and dissolved solids loads. Thus, the use of BMPs as contained in **Appendix B**, and required designed criteria as specified in Chapter 2, are anticipated to substantially reduce the potential delivery of sediment and salts during and following construction. Even with the BMPs and other design criteria, sediment levels would likely be higher than background conditions, based upon increased area of disturbance at the least. However, the riparian fencing along 4.7 miles of Quitchupah Creek would, over time, have the potential to enhance the stream's stability. Fencing will begin within the intermittent reach and continue to the FS boundary, 2.4 miles. It will also be fenced along 1.1 miles of BLM land and 1.2 miles of SITLA land. The length of riparian fencing on each side of the stream would be 4.7 miles, for a total length of 9.4 miles.

Once construction has been completed, disturbances associated with the finished roadway can also provide a source of sediment and salts to streams. The disturbance corridor would be reclaimed, including areas no longer in use as well as road fill, slope, and borrow areas (Section 2.4, Reclamation). Surfaces immediately adjacent to the paved roadway (i.e. shoulders/borrow areas) may revegetate fairly quickly, because they receive additional runoff water from the road surface. Larger, steeper fills and cuts may reclaim more slowly and some erosion may occur. BMPs in **Appendix B** for other slope treatments would minimize erosion potential. And as also described in **Appendix B**, these reclaimed areas would be protected from grazing with electric fence, in order to facilitate revegetation efforts. Sediment loading from rilling or from small mass failures such as slumps occurring on these fill- and cut-slopes could contribute additional sediment to the stream. In turn, this sediment could also contribute increased dissolved solids that could degrade water quality. Once again, slope treatment BMPs, planned monitoring of the road drainage system, and a commitment to timely maintenance are all designed to reduce these events.

Any changes in water quality (as expressed by sediment or dissolved solids loading) due to the proposed road or Alternatives would be difficult to reasonably quantify. In part, this is due to the variable - but

often high - dissolved solids and sediment loads currently conveyed by the stream, and the lack of data on contributing sources. Any prediction of erosion rates (from surface sheet erosion, mass failure, or culvert failure, for example) would be highly speculative due to the geologic, land use, and topographic complexities and interactions, and the existing spatial and temporal variability in the Quitchupah watershed. Further, once the erosion rate was predicted, sediment loading would also have to be modeled, with additional uncertainties introduced. Finally, based upon that prediction, salinity loading estimates would be needed, and would have to account for the fact that different sediment sources produce differing levels of salinity, again adding layers of estimation without adequate data. While it would be possible to model, all of these uncertainties would require that the final predictions be given in the form of a wide range of predicted values.

Given the scale of the Quitchupah Creek watershed at the downstream project boundary (100 square miles) in relation to the area of disturbance (92.3 acres), the predicted modeled background range would be much greater than any additional incremental impact from the small percentage of disturbance that would be predicted, as well as the incremental improvement resulting from the closure and reclamation of the existing road. Even at a finer scale typical of one of the small ephemeral drainages crossed, the percentage of the watershed to be newly disturbed by the road is quite small (in the range of one percent maximum), making an accurate modeling prediction unrealistic. However, these smaller watersheds are, in reality, where greater impacts typically occur; relative increases in stream flows, energy, and sediments can be extreme at these scales, due to drainage areas being increased through draining ditch lines, increased hydrologic connectivity, and other means. The design measures in Chapter 2 and the BMPs in **Appendix B** would reduce these potential effects by spacing cross drains adequately, avoiding drainage capture, and insuring effective dispersal mechanisms, among other means. The planned monitoring and maintenance of the road drainage features would further minimize these kinds of effects.

Qualitatively, we know that: (1) the existing road surface and nearby surfaces are already experiencing erosion at "above background" rates; (2) the new disturbances associated with the construction corridor and cut/fill slopes for the new road would also have the potential to erode at "above background" rates; and (3) the larger contributions of sediments from the watershed are currently coming from sources other than roads. Given the design criteria, BMPs, required monitoring, and the applicant-committed environmental protection measure to install riparian fencing, is it reasonable to assume that, on balance, accelerated erosion associated with the proposed road project would occur but may be less than other contributing factors.

In any case, the closer the road is to the stream, the more likely it is that any eroded material could make its way to the stream and degrade water quality. To provide a relative indication of this, **Table 3.2-3** provides a comparison of the existing condition (equivalent to No Action) and the other Alternatives in regard to proximity to a perennial stream reach. Using this information, the distance of the road from the stream channels can be used as a quantitative means to compare and contrast Alternatives, rather than attempting to model predicted salt or sediment loads.

**Table 3.2-3 Proximity to Perennial Stream - Quitchupah Creek Road and Alternatives**

| Proximity to Stream | Existing Road (Same as Alternative A) (feet) | Alternative B (with existing road reclaimed) (feet) | Alternative C (with much of the existing road reclaimed) (feet) | Alternative D (with much of the existing road left unreclaimed) (feet) |
|---|---|---|---|---|
| <50 feet | 2,500 | 2000 | 2000 | 2500 |
| <500 feet | 35,400 | 33,800 | 32,300 | 38,900 |

In essence, construction of Alternative B would result in a reduction of the length of Quitchupah Creek roadway within 50 feet of perennial stream by 500 feet. It would result in a reduction of length within 500 feet by 1,600 feet.

While the total road width and extent cut and fill slopes associated with the proposed road would be much greater than the width associated with the existing road, the engineering and construction techniques of the new road (constructed to AASHTO & UDOT Standards), coupled with the BMPs contained in **Appendix B** for road drainage, construction reclamation, and maintenance), as well as the aggressive monitoring and maintenance plan that would be implemented, would tend to negate the width difference as far as sediment or runoff concerns. (It is important to note that while revegetation of the existing road reaches that would be abandoned, construction corridor areas, and cut/fill slopes would be done where possible, vegetation is not the primary mechanism for soil stabilization in this area, nor would it be relied up totally to provide erosion control. As discussed in **Appendix B**, other techniques and materials would be used as well as vegetation; and where used, vegetation efforts would be a continuing maintenance item where needed.)

A compacted roadway with proper control of drainage and storm runoff, and use of imported materials such as rock, fill, and/or retaining walls, where necessary, would be an improvement over the current road situation with its native, un-engineered substrate and no drainage controls. However, a tradeoff would be the risks associated with primary and secondary channel crossings as described previously. Further, the existing road receives little or no maintenance through most of its length and little usage. This means that problems that currently develop on it, such as head-cutting up from a side-drainage, go unnoticed and add sediments to the stream on a chronic basis. In contrast, the proposed road would have frequent traffic, primarily with trucks that are dependant upon the road to get their product out, so maintenance would be frequent and problems would be quickly reported and rectified.

It is important to note that the upper terrace banks along Quitchupah Creek are often very unstable, sediment loads are currently high, the stream channel is active, and the stream flow regime is very flashy, so there is always potential for large channel changes caused by changes in its watershed or by rare flow events.

Under normal, typical circumstances, the road may perform well, and cause little or no increase in sedimentation. However, during rare events, destabilization could occur and result in a short term, larger pulse of sediment into the stream. Using a culvert failure as an example, should a greater-than-design event occur, streamflow would likely overtop the road. It may (1) simply cross the road, and continue across the fill without major damage, (2) result in a wedge of roadway and associated fill being eroded away, or (3) it could result in a catastrophic breach. Assuming proper design, placement, and maintenance of culverts (which would be assured by agency review of design specifications, and

implementation of the BMPs contained in **Appendix B**), the calculated risk associated with failure is based upon probabilities, as discussed under the *Stream Crossing Impacts* section above.

Culvert failure could result in a pulse of sediment into the stream. Depending upon circumstance, such a pulse would immediately be carried downstream, or be redeposited close to the failure, or some combination of transport/deposition over some undetermined amount of time. Large, longer term instabilities as a result of crossing failure, such as headcutting back up the drainage that failed, would not be expected because timely repair and maintenance would be done in order to keep the road operational. A larger, more catastrophic failure could have more significant effects, but such a failure is considered unlikely given the specified design criteria, implemented BMPs, and the aggressive monitoring/maintenance programs.

**Impacts to Category 1 Waters and 303(d) Listed Waters**

Any sediment increases would indirectly have the potential to increase TDS, a parameter of concern in the 2004 303(d) listed stream segment downstream of the property. This would depend upon the nature of the eroded materials, which is further discussed in the Soils Technical Report (JBR, 2001d). As noted above, salinity greatly increases in a downstream direction already, and the Utah Division of Water Quality, in its West Colorado Watershed Management Unit Water Quality Assessment Report (UDEQ, 2000) and its companion TMDL (UDEQ 2004), states that the dominant sources for TDS in the 303(d) listed stretch of Quitchupah Creek were natural and agricultural practices.

The implications of the Quitchupah Creek reach downstream of the project being on the 2004 303(d) list, of the uppermost part of Quitchupah Creek within the Project Area being a Category 1 stream, and the entire Project Area being subject to the Colorado River Salinity Control Act all represent potential regulatory issues related to introduction of TDS. Because the 303(d)-listed reach is likely to have a TDS site-specific standard in place by the time the project would be constructed, and because this new (higher) standard would be the basis for DWQ project water quality assessment, as described in Chapter 3, the 303(d) issue may be a moot point. The Division of Water Quality would oversee this aspect of the permitting through its issuance of a permit for storm water discharges during construction, through any issuance of Stream Alteration Permits associated with any crossings and realignments where waters of the State are present, and through the State's 401C Water Quality Certification needed for any wetland permits. Potential temporary, construction related impacts are allowed to occur in streams that have these designations, as long as measures are used to reduce those impacts to the extent feasible. These measures are partially described in BMPs in **Appendix B** and would be further developed with the preparation of the Storm Water Pollution Prevention Plan that would be required. However, some construction-related sediment loading may occur even with these BMPs. This project would not require any new point source discharges of wastewater, which would be much more difficult or impossible to permit in Category 1 or 303(d) listed segments. However, the upper reaches of Convulsion Canyon (a Category 1 reach) that would require realignment may represent a longer term, post-construction source of sediments and salts entering the stream from ongoing erosion of the intercepted steep natural slope adjacent to the realigned channel segments. The wetland enhancement and replacement efforts immediately downstream of the realigned reaches, the agency committed measures, and applicant-committed environmental protection measure for the irrigated areas would help to reduce these potential impacts.

**Other Water Quality Impacts**

Vehicle accidents that result in release of coal, fuel, or other transported materials would be possible on the proposed road, as they are on any road or highway where trucks travel. During most accident occurrences, roadside ditches, cross drains, and many of the culvert crossings would likely be dry. In those instances, should spillage of coal, fuel, or other materials occur, it should be able to be cleaned and

mitigated without contacting storm water runoff or perennial waters. However, there would be some potential for an accident to result in direct release of pollutants such as coal or fuel to Quitchupah Creek itself, either by spilling into the stream itself, or into a culvert crossing during a runoff event. Standard response and cleanup for this type of spill would occur, as directed by a BMP specific to this occurrence as described in **Appendix B**, but there could be some short term effects on water quality and biotic stream components. However, the potential for such accidents to occur would be low. According to SUFCO, over the past five years, only two truck accidents have occurred on the steep, winding Acord Lakes Road, out of an estimated 50 trucks per hour at peak times.

Sand, mixed with deicing chemicals such as commonly used road salt, would be needed during the winter to insure safe driving conditions. BMPs, as described in **Appendix B**, would be applied to ensure that these materials are used in an appropriate manner to minimize contributions to stream sedimentation and salinity, and to protect riparian vegetation and stream biota from the effects of excess salt.

Snow removal would be done according to agency standards so as to minimize effects to stream channels and vegetation.

As specified in the **Appendix B** BMPs, coal trucks would be cleaned prior to entering the road, so their potential to chronically contribute coal dust or other coal particulates would be reduced. However, some minimal potential for coal introduction would always remain.

Other effects on water quality, as indicated by bacteriological, radiological, organic, and trace metal parameters, that are regulated for recreation or cold water aquatics beneficial uses, are not expected to occur as a result of the proposed project. This is because no sources for these types of constituents would be expected to be conveyed along the route on any kind of routine basis.

**Water Quantity/Flow Impacts**

As noted, while it has not been subject to long term stream flow gauging, Quitchupah Creek is known to experience a wide fluctuation in stream flow due to intense storm activity. In part, this is due to the watershed characteristics and condition, which primarily result in a high ratio of runoff to precipitation. In general, disturbances such as road construction tend to locally increase runoff within the area of disturbance when compared to the pre-disturbed condition, and this would be the case for this road as well. In addition, road drainage features such as cross drains, ditches, etc. typically increase the hydrologic connectivity of the system, increasing (at least locally) peak flows associated with any given event. Currently, the existing road has a high degree of connectivity with Quitchupah Creek; because it would be reclaimed, the connectivity it currently provides would diminish. The proposed road would not have a high degree of connectivity due to the planned storm drainage features such as draining ditch lines before they reach channels so that water and sediments can infiltrate/redeposit, draining ditch lines frequently to prevent concentrated overland flow, and other related BMPs described in **Appendix B**.

Whether or not the proposed road would locally increase peak flows would be dependent on the net effect of: (1) removing some of the existing connectivity that occurs from the existing road; (2) minimizing connectivity due to new road drainage features; (3) increasing the distance of the road away from the channel over what is currently; (4) increasing the width of disturbance and runoff production potential; and (5) improving riparian conditions due to grazing reductions. On balance, at least some increase in localized peak flow would be likely. However, the net affect on the hydrologic regime in Quitchupah Creek, already noted to be extremely flashy and variable in flow, and which is and would remain dominated by precipitation patterns and current soil/vegetation characteristics, would likely go unnoticed (Section 2.2 Stream Crossing and Road Culverts).

**Water Rights Impacts**
Water right holders currently have the authority to use Quitchupah Creek waters for instream stock watering and irrigation. The integrity and functioning of the irrigation system would be maintained with the construction of the road; access to those features would be maintained. Although the applicant-committed measure to install riparian fencing and watering stations may redirect instream stock-watering to specific locations on- or off-stream, water right holders' ability to use their water rights would not be compromised. Further, the project would not reduce the amount or quality of available water to meet those rights.

**Groundwater Impacts**
Impacts to groundwater would be minimal, if any, due to its limited extent and depth. Road cuts and drainage ditches are not likely to intercept or redirect groundwater. Field vegetative evidence, direct observations of existing near-road surfaces during various seasons, and soil survey information all indicate little potential for any extensive areas of shallow groundwater that would be likely to be intercepted. However, some very localized areas of seasonal shallow subsurface water related to snow melt may appear at some cut faces. If so, it would be expected to enter inner roadway ditches and be directed to the nearest ditch relief culvert. Any groundwater associated with the impacted wetlands would be minimal in extent and those impacts would be mitigated under the COE 404 permit, as discussed in the wetlands section of the Vegetation Technical Report (JBR, 2001k) and in **Section 3.4**.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**
Potential impacts would generally be the same as for Alternative B, although as shown in **Table 3.2-4**, this alternative would require four more primary crossings than would Alternative B. Further, construction of Alternative C would result in a reduction of the length of Quitchupah Creek roadway within 50 feet of perennial stream by 500 feet as compared with the No Action existing condition. It would result in a reduction of length within 500 feet by 3,100 feet as compared with the No Action existing condition. When compared to Alternative B, Alternative C would result in the same amount of perennial stream within 50 feet of the roadway, and somewhat less within 500 feet as was shown in **Table 3.2-3**.

**Table 3.2-4 Primary Stream Crossings - Alternative C - Alternate Junction**

| Stream Regime | Alternative A Existing Quitchupah Creek Road (denotes primary crossings that are currently in place) | Alternative C Alternate Junction (denotes primary number of crossing placed during construction of new road) | Existing Primary Crossings that would be removed or replaced during construction | Net number of Primary Crossings after construction of Alternative C and removal of existing road |
|---|---|---|---|---|
| Perennial | 8 | 6 | 8 | 6 |
| Intermittent | 0 | 2 | 0 | 2 |
| Ephemeral | 8 | 14 | 8 | 14 |
| Total | 16 | 22 | 16 | 22 |

**Table 3.2-5** provides measurements made in the field at selected larger crossings associated with Alternative C. Most of these are designated primary crossings; the majority of secondary crossings would not likely affect waters of the U.S. The volume per foot column represents the approximate volume of defined waters (under or stream-ward of the OHWM) per foot through the width of the crossing that

would be filled either by the culvert itself or associated back fill. The total volume of fill associated with each crossing would be greater than the amount that is relevant to the waters of the U.S. permitting; there would also be fill associated with each crossing that is placed above the elevation of the OHWM to up to the roadbed elevation. The total volume of fill at each crossing would be indicative of sediment levels that could be contributed to the stream should the crossing fail entirely.

**Table 3.2-5 Waters of the U.S. or State at Selected Crossings – Alternative C Quitchupah Creek Road - Alternative Junction**

| Station | OHWM Width (inches) | OHWM Depth (inches) | Volume per Foot below OHWM (cu. ft.) | Fill Length (feet) | Channel Description |
|---|---|---|---|---|---|
| 11+00 | 30 | 6 | 1.25 | 30 | Intermittent Section of Quitchupah Creek |
| 18+00 | 30 | 6 | 1.25 | 180 | Intermittent Section of Quitchupah Creek |
| 66+00 | 40 | 11 | 3.06 | 170 | East Spring Canyon (perennial) |
| 94+00 | 40/23 | 2 | 0.44 | 200 | ephemeral tributary |
| 186+50 | 52/42 | 6 | 1.95 | 350 | ephemeral tributary |
| 201+00 | 33/21 | 8 | 1.60 | 250 | ephemeral tributary |
| 213+50 | 32/21 | 8 | 1.50 | 250 | ephemeral tributary |
| 228+50 | 108/48 | 18 | 9.75 | 210 | Quitchupah Creek (perennial) |
| 232+50 | 108/48 | 18 | 9.75 | 250 | Quitchupah Creek (perennial) |
| 250+00 | 156/72 | 30 | 23.75 | 80 | North Fork (perennial) |
| 251+50 | 166 | 18 | 20.75 | 130 | Quitchupah Creek (perennial) |
| 256+50 | 166 | 18 | 20.75 | 80 | Quitchupah Creek (perennial) |
| 271+00 | 102/78 | 10 | 6.25 | 200 | ephemeral tributary |
| 268+00 | 57/48 | 5 | 1.82 | 90 | ephemeral tributary |
| 392+00 | 240 | 18 | 30 | 150 | ephemeral wash |
| 410+00 | 70 | 8 | 6 | 150 | ephemeral wash |
| 422+50 | 220 | 18 | 27 | 200 | ephemeral wash |
| 434+50 | 180 | 12 | 15 | 200 | Link Canyon |
| 463+00 | 180 | 12 | 15 | 240 | ephemeral wash |

The calculated probability of failure associated with these culvert installations would be a one percent chance of exceedance in any given year; the probability of failure over 20 years would be 18 percent. Using the means of comparison described previously, the consequences of accepting the 18 percent risk under Alternative C is 1.2 times the assigned Alternative B ranking of 1.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

Under Alternative D, the majority of the existing Quitchupah Creek Road would remain in place and the 16 existing primary watercourse crossings would continue to be used by local traffic. The existing unpaved and little-maintained road would not be reclaimed. However, it would receive increased maintenance and slightly improved drainage with the applicant committed measure to construct water bars, but it would continue to be an erosion/sedimentation source to Quitchupah Creek. In addition, construction of the Water Hollow alignment would require primary watercourse crossings in 20 locations, as shown in **Table 3.2-6**, or two more than in Alternative B. Appropriate permitting and consultations with the COE would be required at some of these. **Table 3.2-7** provides measurements made in the field at the majority of the crossings.

**Table 3.2-6 Primary Stream Crossings -Alternative D - Water Hollow Alternate Alignment**

| Stream Regime | Alternative A Existing Quitchupah Creek Road (denotes primary crossings that are currently in place) | Alternative D Water Hollow Alternate Route (denotes number of primary crossing placed during construction of new road) | Existing Primary Crossings that would be removed or replaced during construction | Net number of Primary Crossings after construction of Alternative D and partial removal of existing road |
|---|---|---|---|---|
| Perennial | 8 | 3 | 1 | 10 |
| Intermittent | 0 | 2 | 0 | 2 |
| Ephemeral | 8 | 15 | 1 | 20 |
| Total | 16 | 20 | 2 | 32 |

**Table 3.2-7 Waters of the U.S. or State at Selected Crossings – Alternative D - Water Hollow Alternate Alignment**

| Station | OHWM Width (inches) | OHWM Depth (inches) | Volume per Foot below OHWM (cu. ft.) | Fill Length (feet) | Channel Description |
|---|---|---|---|---|---|
| 11+00 | 30 | 6 | 1.25 | 60 | Intermittent Section of Quitchupah Creek |
| 18+00 | 30 | 6 | 1.25 | 180 | Intermittent Section of Quitchupah Creek |
| 66+00 | 40 | 11 | 3.06 | 170 | East Spring Canyon (perennial) |
| 94+00 | 40/23 | 2 | 0.44 | 200 | ephemeral tributary |
| 121+50 | 120 | 12 | 10.0 | 250 | Quitchupah Creek |
| 177+00 | 120 | 12 | 10.0 | 400 | Water Hollow |
| 229+50 | 36 | 5 | 1.25 | 200 | Unnamed Ephemeral Wash |
| 255+00 | 60 | 8 | 2.1 | 150 | Unnamed Ephemeral Wash |
| 338+00 | 12 | 4 | 0.3 | 270 | Unnamed Ephemeral Wash |
| 339+50 | 48 | 6 | 2.0 | 130 | Unnamed Ephemeral Wash |

| Station | OHWM Width (inches) | OHWM Depth (inches) | Volume per Foot below OHWM (cu. ft.) | Fill Length (feet) | Channel Description |
|---|---|---|---|---|---|
| 341+50 | 60 | 6 | 2.5 | 150 | Unnamed Ephemeral Wash |
| 366+50 | 72 | 10 | 5.0 | 270 | Unnamed Ephemeral Wash |
| 384+50 | 30 | 5 | 1.0 | 300 | Unnamed Ephemeral Wash |
| 412+50 | 10 | 4 | 0.3 cu. ft. | 150 | Unnamed Ephemeral Wash |
| 419+00 | 48 | 6 | 2.0 cu. ft. | 150 | Unnamed Ephemeral Wash |
| 432+00 | 96 | 6 | 4.0 cu. ft. | 250 | Unnamed Ephemeral Wash |
| 463+00 | 48 | 10 | 3.3 cu. ft. | 300 | Unnamed Ephemeral Wash |
| 471+00 | 48 | 10 | 3.3 cu. ft. | 350 | Unnamed Ephemeral Wash |

Where wildlife crossings (either bridges or large culverts) would supplant 5 of these crossings, fill volume may differ from that listed above.

The calculated probability of failure associated with these culvert installations, is 18 percent that culvert capacity would be exceeded, or, conversely, 82 percent that it wouldn't be exceeded, the same as for Alternative B. Using the means of comparison described above for Alternative B, the consequences of accepting the 18 percent risk under Alternative D is 1.4 times the Alternative B ranking of 1 and 1.17 times the Alternative C ranking. For the five crossings where wildlife bridges would be used, probability of culvert failure would not apply.

Crossings on the Water Hollow alignment would in general have greater total amounts of fill, and the roadway itself would have steeper and longer cut and fill slopes, when compared to Alternative B, because the Water Hollow Alternative contains more highly dissected topography. Consequently, the effectiveness of many of the BMPs under this Alternative may be more difficult to ensure.

This route would avoid the majority of Quitchupah Creek, including its middle and lower reaches that are most susceptible to instability impacts. As shown in **Table 3.3-3**, construction of Alternative D would result in no change in length of roadway within 50 feet of perennial stream, and a net increase of 3,500 feet of roadway within 500 feet of perennial stream. These numbers include both the new road corridor and the portions of the old road which would remain. Because this alternative would result in larger cut and fill slopes, greater crossing risk, higher connectivity near Water Hollow crossing, and because the existing road would remain, it may result in greater impacts associated with erosion and sedimentation than under Alternatives B and C. However, risk to perennial waters due to truck spills and due to subsidence of soluble salt-laden soils would be less under this alternative than under Alternatives B and C.

Impacts due to the realignment of the upper stream reaches would be the same as for Alternative B, as would the implications of the High Quality Waters Category 1 areas.

This Alternative would not require any activities associated with the Quitchupah Creek bridge crossing at SR-10. The Water Hollow crossing would be designed to allow passage of fish through the culvert at this

location. Due to the design constraints associated with this fill and crossing, the road as it approaches Water Hollow would be below grade for over 2500 feet, consequently road runoff, sediments, deicing substances, and any spilled materials would drain directly to Water Hollow.

Wetland mitigation activities, impacts to water right holders, and ground water impacts would be the same for this alternative as previously described for Alternative B.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

Required design criteria, applicant-committed environmental protection measures, and BMPs are identified in Chapter 2 and in **Appendix B**. The potential impacts discussions and conclusions assume that these measures are implemented and effective. All of these measures would be monitored and the treatment repeated or redesigned until satisfactory results occur, as described in the Monitoring Plan. Unintended or unforeseen impacts revealed by monitoring would be remedied to the satisfaction of the landowners.

A monitoring program for the stream realignment at East Spring Canyon would be implemented as described in the Monitoring Plan for Alternatives B and C. A monitoring program to track water quality changes due to the improved irrigation efficiencies is also described in the Monitoring Plan for Alternatives B and C.

To reduce the impacts of accidents and spills, a spill prevention program would be developed and all coal truck drivers would be instructed on what to do in the event of a spill. A spill prevention plan would include a checklist of necessary equipment to be carried on each truck hauling coal. Some examples of equipment to be carried include fire extinguisher, shovel, and absorbent material. In addition, all trucks would need to pass routine inspections and have proper maintenance performed on them regularly. Spills, leaks, and contaminated soils would be cleaned up as per a SUFCO Mine program, to prevent pollution to surface or ground waters. BMPs would be utilized and are described in **Appendix B** and/or in permits obtained in associated with the Proposed Action in **Table 1.5-1**.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

Provided that the BMPs, the applicant-committed environmental protection measures, and the aggressive monitoring/maintenance programs are effective, impacts due to construction would be short term for all alternatives. Over the long term, all alternatives would have the potential to contribute sediment and salts to Quitchupah Creek, as this would be inherent in any road project. However, the use of BMPS, applicant-committed environmental protection measures, and the aggressive monitoring/maintenance programs would reduce this potential as much as possible. Truck accidents could introduce coal and fuel into the streams, however this would be minimized by BMPs for spill kits, training, and rapid response. In some instances however, a spill could produce residual adverse impacts to water resources from Alternatives B, C or D. Alternative D's generally greater distance from perennial waters would reduce this possibility. Construction of any of these build alternatives would be expected to require a substantial commitment of maintenance time and expense for Sevier County, both during and after its use as a coal road, as outlined in the Monitoring Plan.

**CUMULATIVE EFFECTS**

For the purposes of water resources, the cumulative area is defined as the Quitchupah Creek watershed and tributaries downstream to the location where SR-10 crosses the stream. This represents the downstream location of the proposed project.

Several types of past, present, and ongoing land uses (i.e. livestock grazing/trailing, mining, recreation, etc.) occur within the Quitchupah Creek watershed in the vicinity of the Project Area. These uses and related activities may have contributed to upland watershed conditions and exacerbated erosion of already erosion-prone soils. Grazing is a likely cause of erosion; disturbances associated with the SUFCO mine may also be prone to erode. While the SUFCO mine's erosion is mitigated by BMPs and includes sedimentation reduction treatments such as silt fences, erosion from grazing remains untreated and may be more likely to contribute sediments to receiving streams. The proposed project would also have the potential to contribute sediments; under Alternatives B and C, however, much of the existing sediment contribution from the existing road would be eliminated. Under all build alternatives, the BMPs and applicant committed measures have been designed to reduce sediment loading to the extent possible. The applicant committed measure to install riparian fencing on public land adjacent to Quitchupah Creek could also provide reductions in erosion and sediment loading over time. Any increases in sediment from the proposed road would add to the remaining base load, but should be small assuming BMPs are effective and monitoring allows adaptations as needed.

Sediment sources are also sources of salinity. The TMDL study for this area notes high background, ambient salinity loading. The primary point source contributors of TDS in the area are a combined 3,600 tons/year from the SUFCO and CONSOL mine discharges. Using information obtained from the TMDL study, surface erosion and irrigation are responsible for 37 and 21 percent, respectively, of the nonpoint TDS loading in the Quitchupah Creek area. The riparian fencing would also reduce salt loading over time, though the TMDL study indicates that less than one percent of the nonpoint salt loading comes from streambank erosion. Any increases in salt load from the proposed road would add to the remaining base load, but should be small assuming BMPs are effective.

All of these land uses have also contributed (and will continue) to alterations in flow rates in Quitchupah: upland grazing due to vegetation and soils disturbance; irrigation due to withdrawals; and the mine due to discharge of groundwater. The proposed project would be negligible compared with these.

## 3.3 Soils

The Quitchupah Creek Road alignment and all proposed Alternatives would traverse a total of three soil mapping units within Fishlake National Forest (which have been mapped and described by the USFS) and 39 soil mapping units on lands administered by the BLM, SITLA, and private lands (which were surveyed by NRCS in 2000). Soil boundaries and mapping unit designations within the entire Project Area are presented in Final Soils Technical Report, Quitchupah Creek Road EIS (JBR, 2001d).

Near the east end of the existing road are Quaternary deposits consisting of coarse sands to cobbles and boulders with minor fine sand and silt. These alluvial deposits make a substantial portion of the existing road surface.

Throughout the location of the proposed project there may be the possibility of slumping, soil creep, and rock fall that have not been identified on a published map or specifically observed in the field. Numerous slides, slumps, mass movement, and rock fall have occurred in the area in the past and would continue to take place in the future.

Shales and clays are interbedded with sandstones. These clays would have the potential of buckling, warping, slumping, and offsetting of the proposed road surface. Proper road construction techniques and construction designs would be implemented and followed in order to minimize these types of movements. Erosion and salinity are of particular importance to the project. Soil erodibility is based only upon the

physical characteristics of a given soil. For water, erodibility is described by the erodibility factor (K) factor; it rates a soil's susceptibility to detachment and transport by rainfall and runoff. The rating is based upon the interaction of a given soil's properties, including texture, structure, and permeability; because it is based upon inherent soil properties, the K factor is not affected by vegetation that may or may not be present on a soil surface. K values can range from 0.02 to 0.69, with greater values representing higher inherent erodibility. Erosion hazard (by water) is a qualitative ranking that takes into account the soil's inherent erodibility (K value), the slope of the land on which the soil typically occurs, and the soil's permeability class. A given soil may have a high inherent erodibility (as described by its K value), but if it occurs on flat or low gradient slopes and has a rapid permeability, it would have a low erosion hazard ranking. Because of the presence of erodible saline soils, sediments produced by the erosion of saline soils can affect surface water quality.

Similarly, a Wind Erodibility Group (WEG) value is a wind erodibility grouping that indicates a soil's susceptibility to wind erosion based upon its particle resistance as described by the percentage of dry soil aggregates larger than 0.033 inches. WEG values range from one to eight with one being the most erodible; one subgroup is indicated by the letter L, denoting the presence of lime.

Salinity is a measure of a soil's soluble salts as measured by its electrical conductivity. Salinity can range from 0 to greater than 16 millimhos/centimeter. **Table 3.3-1** provides correlations for erodibility and salinity rating values and their standard qualitative descriptors of level.

Soils with water soluble minerals (salts) can be a special concern in road building due to uneven settling caused by improper road drainage.

**Table 3.3-1 Soil Ratings and Descriptors**

| Numerical Rating | Description of Level | Numerical Rating | Description of Level | Numerical Rating | Description of Level |
|---|---|---|---|---|---|
| **Wind Erodibility Group** | | **K Value** | | **Salinity** | |
| 8 | non | .20 or less | low | 0 to 2 | non-saline |
| 5,6,7 | slight | .21-.40 | moderate | 2 to 4 | slightly |
| 3,4,4L | moderate | > .40 | high | 4 to 8 | moderately |
| 2 | high | | | 8 to 16 | strongly |
| 1 | very high | | | > 16 | very strongly |

A summary of the soils present within the Project Area is presented in **Appendix G**. Their locations within the Proposed Action area are presented in **Figure 3-2.**

**Limitations**

The NRCS has developed criteria by which they assess the limitations of various soil types in regard to their potential uses. These limitations are typically contained in tables within published soil surveys. Because the Project Area soils mapping has not been conducted (Sevier County) or is in the initial stages (Emery County) (NRCS 2005), these tables have not yet been developed. However, because many of the soils are equivalent to soils in the Carbon Area survey, that information is applicable to much of the Project Area. In addition, some of the limitation-type information can be inferred from the soils descriptions even where the limitations tables have not been derived. Therefore, **Table 3.3-2** provides,

where available or through synthesis of applicable data, some indication of limitations of the soils in regard to the proposed road construction project. Where information is not available, or cannot be derived from the available information, the symbol N/A (not available) is used.

**Table 3.3-2 Soil Characterizations and Limitations Regarding Proposed Project**

| Soil Name | Typically poor for road fill[1] | Shrink swell concern[2] | Frost heave concern[3] | Inundation Class[4] | Erodibility Ratings[5] | | Salinity Rating[6] |
|---|---|---|---|---|---|---|---|
| | | | | | Wind | Water | |
| Beebe | No | No | No | Rare | X | XX | X |
| Cabba | Yes | No | Yes | None | – | -- | -- |
| Chipeta | Yes | Yes | No | None | X | XX | XX |
| Chupadera | Yes | No | Yes | None | X | X | -- |
| Clifsand | No | No | No | None | -- | X | -- |
| Colorow | No | No | Yes | Rare | X | X | -- |
| Comodore | Yes | No | Yes | None | -- | -- | -- |
| Datino Var. | Yes | No | Yes | None | -- | -- | -- |
| Doney | Yes | No | Yes | None | -- | -- | -- |
| Ferron | No | No | Yes | None | -- | XX | XX |
| Gerst | Yes | Yes | Yes | None | -- | -- | -- |
| Glenberg | No | No | Yes | None | X | X | -- |
| Green River | No | No | Yes | Frequent | X | XX | -- |
| Greybull | Yes | No | No | None | X | X | -- |
| Haverdad | No | Yes | Yes | None | X | X | -- |
| Hernandez | No | No | Yes | None | X | X | -- |
| Hunting | No | Yes | Yes | None | X | XX | XX |
| Juva Var. | No | No | Yes | None | X | X | -- |
| Lazear | Not Known | No | No | None | -- | X | -- |
| Libbings | Yes | Yes | Yes | None | X | XX | XX |
| Minchey | No | Yes | Yes | None | X | X | -- |
| Mivida | No | No | Yes | None | X | XX | -- |
| Moffat | No | No | No | None | X | X | -- |
| Pathead | Yes | No | Yes | None | -- | -- | – |
| Penoyer | No | No | Yes | None | X | XX | -- |

| Soil Name | Typically poor for road fill[1] | Shrink swell concern[2] | Frost heave concern[3] | Inundation Class[4] | Erodibility Ratings[5] | | Salinity Rating[6] |
|---|---|---|---|---|---|---|---|
| | | | | | Wind | Water | |
| Beebe | No | No | No | Rare | X | XX | X |
| Persayo | Yes | Yes | No | None | X | X | XX |
| Pherson | No | No | Yes | None | X | X | -- |
| Pinon | N/A | No | No | None | -- | X | -- |
| Podo | Yes | No | Yes | None | -- | -- | -- |
| Ravola | No | No | No | None | X | XX | X |
| Shupert | No | Yes | Yes | None | -- | X | -- |
| Stormitt | Yes | No | Yes | None | -- | -- | -- |
| Strych | No | No | Yes | None | -- | -- | -- |
| Toddler | N/A | N/A | N/A | None | -- | X | XX |
| Travessilla | Yes | No | Yes | None | | X | -- |
| Trook | No | No | No | None | X | X | -- |
| USFS 21A | Yes | No | No | None | -- | X | -- |
| USFS 69 | No | No | No | Rare | XX | XX | -- |
| USFS 78 | Yes | No | No | None | -- | – | -- |
| Utaline | N/A | N/A | N/A | N/A | -- | X | -- |
| Winetti | No | No | Yes | No | -- | -- | -- |

-- = not of concern X = moderate XX = high for erodibility, strongly saline for salinity

[1]Soils may have properties that may adversely affect the stability of the roadbed.

[2]The shrinking of soil when dry and swelling when wet may affect roadbed stability.

[3]Frost heave causes the soil to expand upward affecting structures.

[4]The frequency of flooding at the soil surface.

[5]The susceptibility of the soil surface to erosion by water and wind.

[6]The relative amount of soluble salts in the soil profile.

Where the available data indicate a range of values that span different ratings, the upper value was used to determine the limitation.

**Prime or Unique Farmlands**

Several soils in the Project Area, in the vicinity of Quitchupah Creek, are classed by the NRCS as Prime Farmlands. Prime or unique farmlands are lands best suited to produce food, feed, fiber, forage, and oilseed crops. These soils meet the criteria only when irrigated. When not irrigated, these soils would be neither Prime Farmland nor would they be considered to be of "Statewide Importance" by the NRCS in Utah. They are mapping units TY (Green River-Juva Variant Complex), PeB (Penoyer Variant loam), TrC (Trook gravelly fine sandy loam), RIA2 (Ravola -Toddler Complex), RIB (Ravola loam), and CIC

(Shupert-Winetti Complex). Only the Trook soil is irrigated. Within the Project Area, there are 20 acres of irrigable land and 145 acres of cultivated land.

## Potential Impacts To Soils

The Environmental Consequences of each Alternative, in regard to soils, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

### REGULATORY

The COE would oversee regulatory requirements in the areas where hydric soils are located (JBR, 2001d). Construction and related soil disturbance within areas mapped as Prime or Unique Farmlands would come under the Farmland Protection Policy Act, which regulates to minimize the impact Federal actions have on the unnecessary and irreversible conversion of farmland to non-agricultural use.

### NO ACTION - ALTERNATIVE A

Soil resources would continue to respond to natural forces in the way they currently do, should the No Action Alternative be chosen. Soils that are erodible would continue to have the potential to easily erode, and saline soils would continue to supply salts to surface waters via runoff and sediments. Erosion of unmaintained two-track road would continue to produce sediments and salinity to Quitchupah Creek.

### QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B

**Table 3.3-3** shows soil mapping units and approximate linear feet of each unit that would be disturbed for this alignment. It is organized by the approximate order in which the soils are encountered from west to east. Note that much of the area is within the existing road footprint and thus has been previously disturbed.

A comparison of **Tables 3.3-2** and **3.3-3** indicates that: approximately 9,200 feet or 19 percent of this alignment may cross soils that are typically poor for road fill; approximately 15,700 feet or 32 percent of this alignment may cross soils that have shrink-swell concerns; 17,300 feet or 36 percent of this alignment may cross soils that have frost heave concerns; and 5,800 feet or 12 percent of this alignment may have rare flooding problems and potential subsidence due to soluble salts. All of these soil characteristics can adversely affect the stability of the roadbed. The incorporation of 12 inches of granular borrow in the roadbed, and the option to use up to 36 inches of granular borrow and geotextile fabric in the construction of the roadbed in particularly unstable areas would, by design, overcome the poor soils conditions underlying the roadbed (JBR 2001d).

Approximately 40,700 feet or 87 percent of this alignment has the potential to cross soils with moderate or severe erodibility ratings and 9,000 feet or 18 percent has the potential to cross moderate to strongly saline soils. These numbers do not include the soils for which this information is not available. In addition, several of the soil mapping units in this area include rock outcrop and badlands, for which soils descriptions are not applicable because these miscellaneous land types are not considered as soil. Rock outcrops are stable and non-eroding, while Badlands are erodible and saline.

These limitations suggest that many of the areas presently disturbed by road construction activities have experienced increased erosion, either by wind or water. Given the proximity of the present alignment to Quitchupah Creek, increased erosion could be increasing sediment loading and increasing salinity to the stream. The inclusion of BMPs in the proposed road design for drainage control and subsequently for erosion and sedimentation, and reclamation of the existing road would help to reduce sediment loading and salinity in the creek from this source.

**Table 3.3-3 Soil Disturbance by Mapping Units - Alternative B**

| Mapping Unit Designation | Major Soils In Unit | Approximate linear feet of disturbance |
|---|---|---|
| 21A | Torriorthents with rock outcrop | 1,700 |
| 69 | Haplustolls | 11,500 |
| CIC | Shupert, Winetti | 2,900 |
| 255 | Gerst, Travessilla , Strych, Rock Outcrop | 2,000 |
| 224 | Mivida | 2,500 |
| 569 | Gerst, Strych, Badland | 1,200 |
| OCA2 | Haverdad | 3,700 |
| GLC | Glenberg, Pherson, Colorow | 4,500 |
| TrC | Trook | 5,000 |
| 131 | Persayo, Badland, Rock Outcrop | 2,800 |
| RlA2 | Ravola, Toddler | 5,200 |
| SMD2 | Stormitt, Minchey | 1,500 |
| BeB | Beebe | 1,000 |
| PeB | Penoyer Variant | 1,200 |
| TY | Green River, Juva Variant | 300 |
| | Total | 47,000 |

A simple application of the Universal Soil Loss Equation (USLE) was done to provide a general indication of the order-of-magnitude change in erosion rate from sheet erosion processes that may occur as a result of roadway disturbances (without the application of the proscribed BMPs). USLE calculates long-term average annual erosion rate in tons/acre/year based upon inputs of rainfall factor, soil erodibility factor, slope length/steepness factor, and cover/practices factor.

To perform this application, a conservative, worst-case type approach was used. By this, the steepest planned road cut or fill slope, of 2h:1v, was used to provide the slope steepness factor. A K factor represented by the worst-case native soils on the Project Area was used in the calculation, and the cover/practice factor was based upon essentially compacted, bare ground that has been seeded but with negligible growth.

Factors used were:

R = 30 (from old SCS statewide R factor map for Utah)
K = .55 (from NRCS mapping information)
LS = 9.5 based upon 2:1 slopes over a 30' length
CP = .8

This results in an estimated sheet erosion rate of 125 tons per acre per year from the disturbed road cut/fill areas. Using a conservative, appropriate area-derived sediment delivery ratio of .4, this estimate results in 50 tons/acre/year of sediment entering Quitchupah Creek from the disturbed, unreclaimed road fill/cut slope areas.

In contrast, the USLE equation was run using more of an existing scenario, assuming a typical plot of ground where the road disturbance would be would have the same R and K values, but that native slope would be 10 percent, length 100' and CP .29 due to some vegetative cover. This results in a background erosion rate of 2 tons/acre/year. Applying the same sediment delivery ratio of 0.4 gives an estimate of .8 tons/acre per year currently from that type of slope.

It is important to note that, for the background and for the roadbed conditions, the calculation represents only one scenario; in reality many other numbers for most of those factors would occur through both the entire watershed and the roadway disturbance, and expected calculation results would vary. Further, application of all of the applicant-committed measures and BMPs would greatly reduce this USLE calculated number; it is presented for illustrative purposes only.

It is also important to note that USLE predicts sheet erosion, not gullying or other forms or slope failure or mass wasting.

Soil characteristics and disturbance figures in **Tables 3.3-2** and **3.3-3** suggest that disturbed areas would experience moderate to severe erosion potential, either by wind or water. Erosion of soils would lead to localized declines in soil quantity, fine litter, and coarse woody debris, as well as increases in bulk density from compaction. Declines in the upper layer of soil, litter, and debris would diminish the quality of the soil structure by the loss of organic matter necessary for supporting vegetative growth. Vegetation would thus be less likely to establish and stabilize the soil, increasing the potential for further erosion. Increases in bulk density from compaction would lead to decreased infiltration and increased runoff, which may increase the TDS load to Quitchupah Creek (see Water Quality, Section 3.2). Measures would be implemented for erosion control, however, to reduce soil losses and compaction (see **Appendix B**).

Approximately 14,600 feet of this alignment would cross soils mapped as Prime or Unique Farmlands, none of which is currently irrigated, and therefore not considered Prime or Unique Farmland at this location. Approximately 600 linear feet (1.4 acres) of the alignment would be within irrigated pasture mapped as Trook gravelly fine sandy loam, a Prime or Unique Farmland.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**

**Table 3.3-4** shows soil mapping units and approximate linear feet of each unit that would be disturbed for this Alternative. Note that a significant part of the area is within the existing road footprint and so has been previously disturbed.

**Table 3.3-4 Soil Disturbance by Mapping Units - Alternative C**

| Mapping Unit Designation | Major Soils In Unit | Approximate linear feet of disturbance |
|---|---|---|
| 21A | Torriorthents with rock outcrops | 1,700 |
| 69 | Haplustolls | 11,500 |
| CIC | Shupert, Winetti | 2,900 |
| 255 | Gerst, Travessilla , Strych, Rock Outcrop | 1,400 |
| 224 | Mivida | 8350 |
| 569 | Gerst, Strych, Badland | 4350 |
| OCA2 | Haverdad | 3,700 |
| GLC | Glenberg, Pherson, Colorow | 1150 |
| TrC | Trook | 4550 |
| 131 | Persayo, Badland, Rock Outcrop | 6850 |
| SlD2 | Clifsand | 250 |
| MsB | Minchey, Clifsand | 1550 |
| NFE | Lazear, Pinyon, Gerst | 200 |
| NNE2 | Gerst, Lazear, Badland | 1,200 |
| | Total | 49,650 |

This alignment is the same as for Alternative B, except for the easternmost leg. Therefore, the impacts would be similar. A comparison of **Tables 3.3-2** and **3.3-4** indicates that: approximately 10,700 feet or 22 percent of this alignment may cross soils that are typically poor for road fill; approximately 19,400 feet or 40 percent of this alignment may cross soils that have shrink-swell concerns; 18,200 feet or 37 percent of this alignment may cross soils that have frost heave concerns; and 2,400 feet or five percent may have occasional flooding problems. The incorporation of 12 inches of granular borrow in the roadbed, and the option to use up to 36 inches of granular borrow in the construction of the roadbed in particularly unstable areas would, by design, overcome the poor soils conditions underlying it.

Approximately 42,800 feet or 86 percent of the alignment has the potential to cross soils with moderate or severe erodibility ratings and 6,000 feet or 12 percent has the potential to cross moderate to strongly saline soils. These limitations suggest that many of the areas presently disturbed by road construction activities have experienced increased erosion, either by wind or water. Given the proximity of the present alignment to Quitchupah Creek, increased erosion could be increasing sediment loading and increasing salinity to the stream. The inclusion of BMPs in the proposed road design for drainage control and subsequently for erosion and sedimentation, and reclamation of existing road would help to reduce sediment loading and salinity in the creek from this source.

The effects of soil loss and sediment production would be similar to that of Alternative B.

Approximately 10,400 feet of this alignment would cross soils mapped as Prime or Unique Farmlands; none of which is currently irrigated, and therefore not considered Prime or Unique Farmland at this

location. Approximately 600 linear feet (1.4 acres) of the alignment would be within irrigated pasture mapped as Trook gravelly fine sandy loam, a Prime and Unique Farmland.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

**Table 3.3-5** shows soil mapping units and approximate linear feet of each unit that would be disturbed for this Alternative.

**Table 3.3-5 Soil Disturbance by Mapping Units - Alternative D**

| Mapping Unit Designation | Major Soils In Unit | Approximate linear feet of disturbance |
|---|---|---|
| 21A | Torriorthents with rock outcrops | 1,700 |
| 69 | Haplustolls | 9,200 |
| 78 | Ustorthents and rubblelands | 2,400 |
| CIC | Shupert, Winetti | 2,300 |
| MUE | Podo, Caba, Doney | 400 |
| 261 | Cabba, Strych, Badland | 2,300 |
| 569 | Gerst, Strych, Badland | 4,100 |
| OCA2 | Haverdad | 2,600 |
| 254 | Gerst, Travessilla, Chupadera | 19,800 |
| AKC2 | Hernandez, Chupadera | 1,000 |
| NNE2 | Gerst, Lazear, Badland | 3,000 |
| 255 | Gerst, Travessilla, Strych, Rock Outcrop | 1,100 |
| 522 | Moffat | 3,000 |
| Not Mapped | Not Mapped | 6,500 |
| | Total | 59,400 |

The first two miles of this alignment would be the same as for Alternative B & C. Approximately 10 percent of the alignment would be in soils that have not yet been mapped by the NRCS. For the remaining soils, a comparison of **Tables 3.3-2** and **3.3-5** indicates that: approximately 31,700 feet or 54 percent of this alignment would cross soils that are typically poor for road fill; approximately 33,900 feet or 58 percent of this alignment would cross soils that have shrink-swell concerns; and 36,000 feet or 61 percent of this alignment would cross soils that have frost heave concerns. The incorporation of 12 inches of granular borrow in the roadbed, and the option to use up to 36 inches of granular borrow in the construction of the roadbed in particularly unstable areas would, by design, overcome the poor soils conditions underlying the roadbed.

Approximately 42,000 feet or 71 percent of alignment has the potential to cross soils with moderate or severe erodibility ratings. No moderate to strongly saline soils are crossed by this alignment. Several of the soil mapping units crossed by the alignment include rock outcrop and badlands, for which soils descriptions are also unavailable. Rock outcrops are stable and badlands erosive and saline.

Effects of soil loss would be similar to Alternative B, although potential sediment introduction relative to Alternative B would be reduced. The incorporation of BMPs for drainage and erosion control would help to reduce the production of sediments from the road corridor. This alignment's distance from perennial waters would reduce the potential for eroded material to result in increased sediment loading.

Approximately 2,300 feet of this alignment would cross soils mapped as Prime or Unique Farmlands, none of which is currently irrigated, and therefore not considered Prime or Unique Farmland at this location.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

Sources of fill material would need to be aggregate based and non-saline to reduce the potential for increased salinity within Quitchupah Creek (See **Appendix B)**. The road drainage system would be monitored for three years minimum to ensure it is fully functional; thus, reducing sediment discharge into the natural drainages.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

Depending on the alignment selected, between 45 and 55 acres of permanent disturbance would occur to soil resources. The selected Alternative would result in 92.3 to 146.3 total acres of disturbance, of which approximately 57 to 106 acres of soil resources would be reclaimed depending on the Alternative alignment that is selected. The Proposed Action would cross 600 feet of irrigated and 14,600 feet of non-irrigated Prime Farmland. For Alternative C, the same 600 feet of irrigated Prime and Unique Farmland would be crossed; however, 10,400 feet of non-irrigated Prime Farmland would be affected. Alternative D crosses 2,300 feet of non-irrigated Prime and Unique Farmland.

**CUMULATIVE EFFECTS**

Past and present impacts to soils include erosion due to the Quitchupah Creek road, livestock trailing/grazing, mining, and recreation. These uses and related activities may have contributed to exacerbated erosion of already erosion-prone soils. Approximately 25 to 30 percent of the proposed road alignment in the Quitchupah Creek area is located on erodible soils as defined by NRCS. The disturbance of erosive soils contributes sediments and salts to the creek. The Proposed Action would stabilize some of this erosion. Unstable soil areas could be a high maintenance item in the future as evidenced by maintenance requirements in the unstable areas within the SR-10 alignment. Reclaimed portions of the existing road surfaces (7.6, 5.6, or 1.8 acres depending on Alternative) would become available through natural processes for productivity. While the SUFCO mine's erosion is mitigated by BMPs and includes sedimentation reduction treatments such as silt fences, erosion from grazing remains untreated. The proposed project would also have the potential to contribute to erosion. Under all build alternatives, the BMPs and applicant committed measures have been designed to reduce soil erosion to the extent possible. The applicant committed measure to install riparian fencing on public land adjacent to Quitchupah Creek could also provide reductions in erosion over time. There would be no cumulative effects to soils.

## 3.4 Vegetation and Wetlands

**VEGETATION**

Vegetation within the Project Area varies from the greasewood community at lower elevations to the Douglas-fir woodland on north slopes at the junction with Acord Lakes Road (**Figure 3-3**). Vegetation types within the corridor include cultivated pastures, riparian zones along Quitchupah Creek, wetlands, and big sagebrush flats. Signs of heavy grazing are evident in the condition of understory vegetation, lack of vegetation, and soil disturbance.

The Proposed Action (Alternative B) crosses Douglas fir woodland and mountain brush at the upper elevations, wetlands, pinyon-juniper, greasewood, and basin big sagebrush, as well as irrigated pasture.

Alternative C follows Alternative B through the above-listed vegetation types, and then turns to the north and traverses a series of drainages as well as Link Canyon Wash. This area is mainly sparse pinyon-juniper with limited understory; greasewood occurs in the main washes.

Vegetation on the Water Hollow Benches, along Alternative D, consists of an open pinyon-juniper community with an underlying black sagebrush shrub cover, and various grasses and forbs. Chaining to improve wildlife habitat occurred on these benches about 40 years ago.

In the draws, serviceberry, mountain mahogany, and yucca are present on north facing slopes. Nearest the Water Hollow route junction with SR-10 is an area of open pinyon-juniper "parkland" with low sage providing fairly sparse ground cover, and grasses which reflect heavy grazing. Other plants include yucca, Mormon tea, cactus, and the more common variety of townsendia (Jones). Soils on many areas of this route are cryptogamic. The bottomlands are cut by deep gullies similar to the active downcutting in the Quitchupah drainage.

Following is a brief description of each community in the Project Area. Lists of plant species recorded during field review of each Alternative are included in **Appendix H**.

**Greasewood Community**
The greasewood community is present throughout the lower elevation portions of the Project Area, in combination with shadscale and/or sagebrush, rabbitbrush, and patchy understory grasses. Included in this type are pockets of a low shrub community (shadscale and sagebrush) where greasewood is lacking.

**Low Shrub Community**
This low, desert shrub community occurs as inclusions in the greasewood community and is also found on the gently sloping bench at the junction of Alternative C and SR-10. It includes Castle Valley saltbush, low sage, Mormon tea, snakeweed, and various forbs, grasses, and cacti.

**Pinyon-Juniper Community**
The pinyon-juniper community type includes areas of sparse juniper on the steep, rocky slopes above Quitchupah Creek Road, as well as the pinyon and juniper present on slopes in the upper parts of the canyon.

**Mountain Brush Community**
The mountain brush community occurs in the bottom areas of the upper canyon and includes patches of gambel's oak as well as bigtooth maple, serviceberry, woods rose, Oregon grape, sagebrush, rabbitbrush, and manzanita.

**Douglas Fir Woodland**
Near the junction of Quitchupah Creek Road and Acord Lakes Road at about 7,600 feet elevation, the vegetation on the north facing slopes transitions to a Douglas Fir Woodland, with Mountain Brush in the drainage bottom. Across the Acord Lakes Road on south facing slopes, the pinyon-juniper community predominates, and includes mountain mahogany.

**Invasive Species and Noxious Weeds**
The Utah State Noxious Weed List includes plants that have been determined to be especially injurious to public health, crops, livestock, land, or other property. Under the Utah Administrative Code, R68-9, the following weeds have been officially listed as noxious for the State of Utah:

| Common Name | Scientific Name | Common Name | Scientific Name |
|---|---|---|---|
| Bermudagrass | *Cynodon dactylon* | perennial pepperweed | *Lepidium latifolium* |
| Canada thistle | *Circium arvense* | perennial sorghum | *Sorghum halepense* |
| diffuse knapweed | *Centaurea diffusa* | purple loosestrife | *Lythrum salicaria L.* |
| Dyers woad | *Isatis tinctoria* | quackgrass | *Agropyron repens* |
| field bindweed | *Convolvulus arvensis* | Russian knapweed | *Centaurea repens* |
| hoary cress | *Cardaria draba* | Russian olive* | *Elaeagnus angustifolia* |
| Johnsongrass | *Sorghum halepense* | Scotch thistle | *Onopordum acanthium* |
| leafy spurge | *Euphorbia esula* | spotted knapweed | *Centaurea maculosa* |
| Medusahead | *Taeniatherum caput-medusae* | squarrose knapweed | *Centaurea squarrosa* |
| musk thistle | *Carduus nutans* | yellow starthistle | *Centaurea solstitalis* |

*Sevier County (UDAF 2003)

Neither Sevier County nor Emery County maintains a separate, additional list; both counties have adopted the official State list. The Utah State list added a county noxious weeds addendum list in 2003; Russian olive is listed as an additional noxious weed for Sevier County. According to the Digital Atlas of the Vascular Plants of Utah, field bindweed and hoary cress are the two plants that have been located in Emery and/or Sevier County. These plants could be present in the Project Area but were not located during field inventories.

**Threatened, Endangered, and Sensitive (TES) Species**

Several TES plant species have the potential to occur in the Project Area. A full discussion of those species is contained in **Section 3.7** and the Final Special Status Species Technical Report, Quitchupah Creek Road EIS (JBR, 2001f).

**WETLANDS**

The upland plant community is a sagebrush *(Artemisia sp.)* - grass community located on unsurveyed coarse textured soils and unsurveyed fine textured erodible soils of the terraces and benches. A riparian plant community dominated by tamarisk (*Tamarix pentandra)* and willows (*Salix exigua*) exists on the banks of Quitchupah Creek. The stream in Convulsion Canyon from the juncture of East Spring Canyon is deeply incised and riparian zones are limited and narrow.

The most common wetland community at the upper elevations is a herbaceous community of grasses, sedge (*Carex aquatilis)*, water cress (*Rorripa nasturtium-aquaticum*), and willows. The wetland community at the lower elevations consists of salt grass (*Distichlis spicata),* rush (*Juncus arcticus*), and tamarisk. The wetland community at the lower elevations consisted of salt grass, virgins bower (*Clematis ligusticifolia*), woods rose (*Rosa woodsii*), silverberry (*Elaeagnus commutata*), marestail (*Hippuris vulgaris*), and *Viola sp.* This wetland community is generally found on sandy alluvial soils and loams of the floodplains. The wetland community or hydric fringe along the stream banks is absent due to scouring in some places, and well developed at other sites.

Five Jurisdictional Wetlands (JW) were delineated within the survey area. A Jurisdictional Wetland is a wetland determined to be under the jurisdiction of the U.S. Army Corps of Engineers (COE) according to established guidelines. Each is located on the floodplain associated with the stream channel. One wetland is located in an oxbow, not directly connected to the channel. A summary for each wetland is shown in **Table 3.4-1** and map locations are on **Figure 3-3.**

**Table 3.4-1 Jurisdictional Wetlands Types and Acreages**

| JW Area | Site | Hydrology | Acreage |
|---|---|---|---|
| 44+00* | floodplain | seep | 0.07 |
| 48+00* | floodplain | spring | 0.31 |
| 67+00* | floodplain | stream | 0.26 |
| 213+00 | floodplain - oxbow | stream | 0.46 |
| 255+00 | floodplain | stream | 0.34 |
| *These JWs are common to all of the action alternatives | | | |

## Potential Impacts To Vegetation And Wetlands

The Environmental Consequences of each Alternative, in regard to vegetation and wetlands, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

**REGULATORY**

The 404 permitting process would include verification and approval by the COE of the JW delineation for the Quitchupah Creek Road corridor and of the proposed mitigation plan. An individual 404 permit would be required to fill any wetlands. The design under all alternatives would fill two wetlands: the one located at 44+00 (.07 acres) and the one at 67+00 (.26 acres). The individual 404 permit would also include any non-wetland Waters of the U.S. impacts. (The COE has indicated that it would take the lead for all of the wetland and Waters of the U.S. permitting for this project, thus Stream Alteration Permits from the State would not be needed per se, instead, they would be tied to the individual COE permit.)

An individual federal permit from the COE is required when dredge and fill activities are expected to have significant impacts on wetlands or other Waters of the U.S. The Clean Water Act, Section 404, provides direction for this permitting process. The granting of a permit is a "federal action" for purposes of the Endangered Species Act, such that if a listed species may be affected, a 404 permit request triggers the need for consultation with the relevant agency (i.e. USFWS or NMFS). The district engineer makes a decision to issue or deny the permit, and makes a 'statement of finding document' available to the public which explains how the permit decision was made.

**NO ACTION - ALTERNATIVE A**

The vegetation communities in the Project Area would not be disturbed by the proposed road construction. Current land uses such as grazing would continue to impact the vegetation communities. Wetlands would not be disturbed, nor would they be enhanced under this alternative.

**POTENTIAL IMPACTS**

**Impacts Common to All Alignments**:

It is estimated that approximately 0.33 acres of Jurisdictional Wetlands in the Convulsion Canyon drainage would be filled by road construction.

Additionally, 1 acre of riparian habitat in the Convulsion Canyon drainage would be impacted by road construction. Removal of streamside vegetation in the upper parts of the Canyon has the potential to increase stream temperature, however the majority of the streamlength below the Forest is fairly open and lacking cover; any minimal increase in stream temperature would not be expected to affect stream habitats or aquatic populations downstream.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**

Approximately 92.3 acres of vegetation would be disturbed by construction of the road, pull-outs, and staging areas. This would include 64.5 acres greasewood community, 1.0 acre pinyon-juniper, 25 acres mountain brush, 0.5 acres Douglas-fir woodland, and 1.3 acres wetland/riparian. Of the total 92.3 acres, it is expected that 47 acres of uplands would be reclaimed. A discussion of reclamation procedures is provided in Section 2.2.

The 92.3 acres of disturbance would be subject to noxious weed invasion until construction was complete and reclamation had stabilized the disturbed acreage.

Additional vegetation would be disturbed during the construction of the SR-10 junction. This disturbance would occur within the UDOT right-of-way or acquired right-of-way.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**

Under this Alternative, total disturbed acreage would be slightly more than Alternative B. This 96.3 acres would include approximately 49.3 acres greasewood, 18.2 acres pinyon-juniper, 25 acres mountain brush, 0.5 acres Douglas-fir woodland, 2.0 acres of low shrub, and 1.3 acres wetland/riparian. Approximately 50 acres of uplands would be reclaimed.

The 96.3 acres of disturbance would be subject to noxious weed invasion until construction was complete and reclamation had stabilized the disturbed acreage.

Additional vegetation would be disturbed during the construction of the SR-10 junction. This disturbance would occur within the UDOT right-of-way or acquired right-of-way.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

Approximately 146.3 acres of vegetation would be disturbed by construction of the road. This would include approximately 0.5 acres Douglas-fir woodland, 1.3 acres wetland/riparian, 85 acres pinyon-juniper, 23 acres low shrub, and 36.5 acres mountain brush. Approximately 91 upland acres of the 146.3-acre disturbance would be reclaimed.

The 146.3 acres of disturbance would be subject to noxious weed invasion until construction was complete and reclamation had stabilized the disturbed acreage.

Additional vegetation would be disturbed during the construction of the SR-10 junction. This disturbance would occur within the UDOT right-of-way or acquired right-of-way.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

A noxious weed control plan would be developed in cooperation with the land management agencies and implemented as necessary. Mitigation and monitoring for impacts to wetlands within the Proposed Action area would be coordinated with the COE during Clean Water Act Section 404 Permitting. The constructed wetland complex and the one enhanced wetland would be monitored for a minimum of five years to insure functioning JWs are established. The reclaimed areas would also be monitored and tested to insure the goal of cover and secondary succession are achieved prior to release (see Quitchupah Creek Monitoring Plan).

Under the proposed wetlands mitigation plan (See Section 2.2), 1.2 acres of willow/weed community would be converted to wetlands, and 1.0 acres of sagebrush community would be converted to a wetlands/riparian community due to realignment of East Spring Canyon.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

Approximately 45 to 55 acres of permanent disturbance to vegetation communities would occur as a result of the proposed road. Of the 92.3 to 146.3 acres of total disturbance that would occur as a result of the Proposed Action or Action Alternatives, a total of 47 to 91 acres of upland vegetation would be reclaimed. A total of 0.33 acres of wetland and approximately 1.0 acre of riparian vegetation would be disturbed as a result of the Proposed Action or Alternatives but would be mitigated through construction of 1.22 acres of wetlands and overall improvement of the riparian corridor through fencing from grazing. No residual adverse impacts were identified for vegetation or wetland resources within the Project Area.

**CUMULATIVE EFFECTS**

The past land practices of grazing and farming have changed the plant communities in the Project Area through overgrazing of vegetation, chainings, seedings, and agricultural development. The current grazing system will reinforce these changes in the future. The Agency Committed Measures, discussed in Chapter 2, would restrict grazing in riparian areas, thereby allowing some recovery of vegetation in these areas over time. While the permanent loss of vegetated acreage would accrue due to the construction of the road, the project would not affect changes in the overall plant communities. Reasonably foreseeable actions such as exploration of federal oil and gas leases could disturb additional acreage in the future but disturbance would be reclaimed unless discovery leads to development. The removal of grazing from 4.7 miles of stream corridor would restore the riparian zone in this reach of the stream.

## 3.5 Wildlife Resources

The following description of the existing affected environment includes the Proposed Action and Alternatives. Unless otherwise specifically noted, there are no substantial differences in the wildlife resources above the confluence with Water Hollow and Quitchupah drainages, where Alternative D diverges from Alternatives B and C.

MAMMALS

The diversity of mammal species includes members of the rodent family, bats, intermediately sized species such as skunks, coyotes, badgers, bobcats, cottontails,
and jackrabbits, and big animals including elk, mule deer, mountain lion, and bear.

**Big Game**

Elk (*Cervus canadensis*) and mule deer (*Odocoileus hemionus*) are highly visible mammals that commonly occur in the area. The Project Area is within the Manti-Nebo Herd Unit (#16) for elk and mule deer. Elk population estimates are conducted yearly by the UDWR utilizing air and ground based observations. Based upon yearly census data, an elk herd of approximately 700-1200 individuals reside within and adjacent to the Project Area year round (personal communication, Jeff Grandison and Leon Bogedahl, UDWR, 2002). In 1998, a total of 1,211 elk were observed within and near the Project Area and a total of 894 elk were observed in 2001, a heavy snow year. Sightings of elk utilizing the Project Area are found in **Figure 3-4.** UDWR does not conduct census data for mule deer in the Project Area.

The UDWR has identified various types of ranges for each species, including critical and high value winter ranges. Critical and high value winter use and high value summer use areas for elk, and critical and high value winter use areas for deer occur within the Quitchupah Creek drainage (**Figure 3-4**). These types of ranges are defined as:

Critical or crucial ranges are sensitive use areas that are limited in availability or provide unique qualities for high interest wildlife. These areas constitute irreplaceable, critical requirements for these species.

High value ranges are intensive use areas that due to relatively wide distribution do not constitute critical values but which are highly important to high interest wildlife.

Elk winter range use occurs on snow-free open areas, such as the grassland and sagebrush vegetation types associated with lower elevations and drainage bottoms. Mule deer use the south-facing slopes, mountain shrub communities, and riparian areas in the drainage. The mule deer move out of the area to higher elevations in spring to heavier cover for fawning and areas of greater herbaceous and shrub cover for summer.

High value summer range for deer occurs adjacent to the Project Area south of Convulsion Canyon. The Water Hollow Benches area, through which an alternate alignment (Alternate D) would pass, is also within critical and high value elk and deer winter range. In high snow years, this area is classified as critical elk winter range. Ground based surveys in the 1980's through the early 1990's showed elk (150-300 individuals) regularly utilizing the Water Hollow Benches and drainage area, including the Alternative D alignment (personal communication, Ron Hodson, UDWR, 2002). In the 1991-1992 elk census, 287 elk utilized the Water Hollow Benches area. A 1997 elk census reported a concentration of elk on the Saleratus Benches area, located between the Water Hollow Benches and SR-10. Critical elk winter range occurs adjacent to the Project Area, in high snow years the high value elk winter range in the Project Area is reclassified as critical elk winter range.

The Project Area is within big game migration summer and winter range routes. The migration route runs generally in a west-east direction from the highlands to lowlands and benches. Big game may roam in a north-south pattern in the winter season. The Quitchupah Creek Road alignments (Alternative B and Alternative C) run parallel to the migration route. The Water Hollow road alignment (Alternative D) would bisect the migration route.

In the 1950's, vegetative chainings and seedings were completed on Water Hollow and Saleratus Benches in order to attempt to improve forage for wildlife and livestock. These areas are now in poor condition and do not support any more forage for elk than the adjacent unseeded sagebrush and pinyon-juniper communities. However, these benches continue to support fairly large numbers of wintering elk and deer.

In addition to elk and deer, several moose (*Alces alces*) have been relocated into the Fishlake National Forest with marginal success. One moose has been known to travel through the Quitchupah drainage during the winter months (Rasmussen, 1999). Black bear (*Ursus americanus*) are also known to occasionally occur at the higher elevations of the Quitchupah Creek drainage, but are not very common.

### *Wildlife and Noise*

Currently there is a minimally used dirt road/trail through Quitchupah Canyon and a lesser used dirt track/trail on the Water Hollow Benches. Traffic related noise is currently distant mining and coal traffic activity and infrequent/sporadic to non-existent localized man-made noise in the Project Area.

Wildlife species are often less common or absent near roads, which effectively results in a "road-avoidance zone" (Forman et al. 2003). The road-avoidance zone is interpreted as mainly due to traffic noise, rather than the existence of the road itself, and is evident from correlations of wildlife density with

distance from roads (Forman et al. 2003). This zone varies by species. Deer appear to have an avoidance zone of 100-300 meters (328 – 984 feet) from roads and elk may have a road-avoidance zone several hundred meters (984 feet+) wide depending on the number of vehicles passing per day.

**Bats**

Riparian areas within the Quitchupah Creek drainage provide foraging habitat for a variety of bat species. The forested areas and surrounding escarpments provide roosting sites for summer resident bats and hibernation sites for year-long resident bats. Bats use riparian areas extensively for foraging due to the abundance of insects. The Townsend's big-eared bat (*Corynorhinus townsendii*) and the spotted bat (*Euderma maculatum*), both sensitive forest species, are discussed in greater detail in **Section 3.7** and the Final Special Status Species Technical Report, Quitchupah Creek Road EIS (JBR, 2001f).

BIRDS

A variety of vegetation types throughout the Project Area provide habitats for many species of birds. While each vegetation type offers important habitat components, the riparian areas that occur along Quitchupah Creek are the most heavily utilized by the birds in the area. The riparian areas are important during migration as these are often the only habitats within the arid west that have similar characteristics of more mesic habitats found outside the Intermountain region. The abundance of insects makes riparian areas important foraging habitats for species that nest in the grass or shrublands adjacent to the riparian areas.

On the Water Hollow Benches, south of Quitchupah Creek, birds associated with the dominant Pinyon-Juniper/Mountain Brush communities are most likely to occur.

**Raptors**

The timbered areas within the upper drainage area of Quitchupah Creek, as well as escarpments in the Project Area, provide numerous nesting opportunities for raptors. Foraging opportunities for raptors are also plentiful and occur throughout the various habitat types found within the area. The aerial survey performed by UDWR in 2000 identified 13 raptor nests within one mile of the proposed Quitchupah Creek Road alignment: one prairie falcon (*Falco mexicanus*) nest and 12 golden eagle (*Aquila chrysaetos*) nests. Of the 12 golden eagle nests, three were listed as active, seven as inactive, and two were tended. The prairie falcon nest was listed as active during the 2000 aerial survey. The recommended seasonal (i.e., timing restriction) and spatial (i.e., proximity restriction) buffers for the prairie falcon and golden eagle are 4/1-8/31 and 0.25 miles, and 1/1-8/31 and 0.5 miles, respectively (Romin and Muck 2002). Nine of the 13 nests (all golden eagle) were located within 0.5 miles (the spatial buffer zone distance required for active golden eagle nests during the dates of January 1 through August 31) of proposed activities and five of those were either tended or active in 2000.

The survey also identified four raptor nests within one-half mile of portions of the Water Hollow alignment (Alternative D) that occur apart from the Quitchupah Creek Road area: two tended golden eagle nests, one active great horned-owl nest (0.25 mile buffer, 12/1-9/31), and one American kestrel (buffer not necessary) nest. Raptor surveys conducted in Spring 2005 showed eight inactive golden eagle nests within 0.5 mile of the Proposed Quitchupah Creek Road and one tended golden eagle nest near the top of the route in Convulsion Canyon (UDWR 2005). Helicopter surveys over the Water Hollow benches recorded four inactive golden eagle nests, two tended golden eagle nests, and one great horned owl nest.

Several other raptors, such as red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and sharp-shinned hawk (*Accipiter striatus*) may nest in the aspen or conifer stands, or forage within the various vegetation types of the analysis area.

**Upland Game Birds**
Ruffed grouse (*Bonasa umbellus*) have been found in the upper reaches of the Quitchupah Creek drainage area. No known sage grouse (*Centrocercus urophasianus*) leks are located within the Project Area or the general vicinity. Chukar (*Alectoris chukar*) do occur in the drainage area, but are not abundant.

AMPHIBIANS
UDWR identified seven amphibian species that could potentially occur within the Project Area: one salamander (tiger salamander - *Ambystoma tigrinum*), four toads (Great Basin Spadefoot toad - *Spea intermontanus*, boreal toad - *Bufo boreas*, Great Plains toad - *Bufo cognatus*, Woodhouse's toad - *Bufo woodhousei*), and two frogs (boreal chorus frog - *Pseudacris maculata*, northern leopard frog - *Rana pipiens*). Amphibians' dependence on water limits their distribution in the Project Area. Perennial water is available in Quitchupah Creek and associated springs, as well as lower portions of East Spring Canyon Creek and lower Water Hollow Creek at their confluences with Quitchupah Creek. Ephemeral water sources occur in minor drainages that are tributary to Quitchupah Creek. These sites are used as breeding sites and areas where the young develop.

One amphibian species was observed during the amphibian surveys conducted in the Quitchupah Creek drainage in 1999. Numerous tadpoles and young Great Basin Spadefoot Toads (*Spea intermontanus*) were discovered in a wetland area south of Quitchupah Creek, located in the SW¼ of Section 16, Township 22 South, Range 5 East. No other amphibian species were observed within the Quitchupah Creek Road alignments (Alternatives B and C). Amphibian surveys were not conducted within the Water Hollow Benches area since appropriate habitat is not present. Similar species to those potentially found in the Quitchupah Creek Road alignment also have the possibility of being found within the Water Hollow area, however, the lack of riparian/wetland habitat limits their potential abundance.

REPTILES
Because of the different habitat types found within the Project Area, the potential for a variety of reptile species to occur is fairly high. Based upon habitat requirements, of the 36 species of reptiles that occur in southeastern Utah, less than half could potentially occur within the area. The sagebrush lizard (*Sceloporus graciosus*) and western terrestrial garter snake (*Thamnophis elegans*) were two of the common reptiles observed during various field studies.

MANAGEMENT INDICATOR SPECIES
This Fishlake National Forest Plan designates certain species as "management indicator species" (MIS). There are both high interest MIS (such as elk, mule deer, Bonneville cutthroat trout], and ecological indicator MIS (such as northern goshawk cavity nesters, macroinvertebrates and resident trout). These species are monitored at the Forest plan level in order to determine the effects of forest management under the plan on habitats and wildlife species.

A complete description of each plan-designated MIS and the forest's monitoring results are contained in the Technical Report Addendum and a more recently prepared report, Life History and Analysis of Endangered, Threatened, Candidate, Sensitive, and MIS for Fishlake NF (February 2004).

## Potential Impacts To Wildlife

The Environmental Consequences of each Alternative, in regard to wildlife, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

**REGULATORY**
Although specific permits would not be required for construction activities in regard to wildlife resources, UDWR has been consulted and consultation with UDWR would continue for mitigation and reclamation requirements for impacted big game range use areas and other wildlife related issues. These requirements would likely include construction timing limitations to prevent impacts to big game and raptors during key seasons.

**NO ACTION - ALTERNATIVE A**
Selection of the No Action Alternative would not result in any direct, indirect, or cumulative impacts to wildlife resources in the Project Area. The road would not be constructed in the Quitchupah Creek drainage and no disturbance would be anticipated. The existing environment in the Quitchupah Creek drainage would remain unchanged and current uses would be expected to continue for the near future.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**

*Wildlife*

The proposed road in the Project Area could interfere with big game use of the winter ranges on the benches and in the agricultural fields. Traffic on the roads in the form of large loaded trucks driving downhill would be a hazard to all wildlife, especially big game and raptors.

Raptor nesting within the Project Area could be affected by road construction; however, the UDWR buffer periods for raptors during critical nesting times would minimize this potential impact. Birds that are established in the area would be less likely to be affected by the increased activity and disturbance related to road construction outside of the critical nesting season.

The Project Area is home to a wide variety of wildlife species that could be impacted by the construction of the road and subsequent haul truck traffic.

As described in the water resources section, there would be some potential for increases in sedimentation and further destabilization of Quitchupah Creek and other creeks in the Project Area that could impact fisheries and aquatic macroinvertebrates in the streams. The loss of the hydric fringe and stream-side wetlands until reclamation and mitigation were completed could temporarily affect the reproductive success of fish species and some macroinvertebrates species that depend on vegetation for cover and prey.

Habitat fragmentation would occur along the alignment. Numerous studies have shown that many species of small mammals avoid roads (Adams, 1983; Conrey 2001; Mader 1984). The effect of the road would essentially divide these populations. Many studies have found that roadways decrease the diversity, spatial distribution, and density of wildlife that avoid roads. Studies suggest that the effect of habitat fragmentation is worse for a four lane road than a two lane road; however, the frequency of traffic along these roads plays a more important role for the effect on animal populations (Noss, 2002). Species dependant on Quitchupah Creek for forage and reproduction would have to cross the roadway. Road kills of small mammals, reptiles, and amphibians would likely increase. Animals attracted to the roads, such as reptiles for basking, small mammals attracted to roadside vegetation, birds using road gravel for digestion, and wildlife that use roads for travel corridors, would be more susceptible for vehicular collisions (Noss, 2002).

Additional studies have documented that suitable habitat adjacent to roads experience a loss of overall populations of wildlife, especially small mammals, reptiles, amphibians (Reh and Seitz 1990), and birds

(Reijnen and Foppen, 1994; Van Der Zande et. al., 1980; Reijnen, Foppen, Thissen, 1995). Most of the adjacent riparian habitat, which was identified as poor quality riparian habitat, would be near the proposed road alignment. Though no quantitative studies of riparian avian species, amphibians, reptiles, or small mammals have been conducted in the Project Area, it can be assumed that the habitat may be under-utilized after construction of the road. The loss of wildlife to vehicle collisions may reduce the overall populations of wildlife in the area even though the habitat in the area is improved. Without long term trend data on the species of wildlife that occur in the area, it is difficult to quantify the loss of wildlife populations and the effects of the proposed roadway.

MAMMALS

**Big Game**

Road construction activities would result in total new surface disturbance of 92.3 acres. All disturbances would occur within deer and elk high value or critical winter range (See **Figure 3-4**). After reclamation of some of the disturbance associated with construction in the road corridor, and reclamation of all of the staging areas, there would be a net permanent loss of 45 acres. Complete revegetation of the 47 reclaimed acres would probably require several years.

Displacement of resident big game would occur during construction activities. However, the majority of construction activities would occur during the summer and fall when big game are not as abundant in the Project Area, thus limiting the displacement impact.

After construction, big game would likely avoid or move away from the disturbance (i.e. vehicle traffic and noise) caused by the road to other suitable habitat areas as elk tend to avoid roads. Habitat near the road would be underused as the big game animals would tend to be displaced from this area. According to studies, the density of animals and overall species richness decrease with increasing proximity to a road (USFWS, 1999). This displacement could alter the natural distribution patterns and result in the overuse of other habitat areas if big game animals become concentrated, especially during winter.

Wildlife fencing would exclude the majority of animals (wildlife and livestock) from the road, therefore mortality and injury of big game resulting from collisions with vehicles is unlikely to occur. Also, this alignment runs parallel to the migration route for big game which would further reduce the likelihood of vehicle collisions to migrating big game as compared to the Alternative D alignment.

As vegetation becomes reestablished in the reclaimed portions of the road construction corridor, game may be attracted toward the road by palatable species growing within the corridor; agency-specified seed mixes that include alfalfa, yellow sweet clover, and crested wheatgrass would attract big game animals to the road side during certain times of the year. Fencing would keep them off the road but would likely allow access to some of the reclamation areas.

**Bats**

Impacts would occur to suitable foraging areas for bats within riparian habitat. Approximately 1.0 acre of riparian habitat and .33 acres of wetlands (potential foraging habitat) would be impacted by the construction activities. The forested areas and surrounding escarpments that potentially provide roosting sites for summer resident bats and hibernation sites for year-long resident bats might temporarily be impacted by blasting activities that may be required during construction.

BIRDS

Several of the habitat types used by birds in the Project Area would be impacted by construction activities. Of the 92.3 acres of proposed new surface disturbance, most of the disturbance would occur

within habitats that are abundant throughout the Quitchupah Creek drainage. However, the riparian habitat that would be impacted near the western end of the alignment would be reclaimed with riparian plantings. The types of birds that currently use this riparian area may leave the area during construction activities but would return when mitigation is complete.

Construction activities would cause displacement of birds to similar adjacent areas and would likely have minor impacts to the displaced birds. Increased mortality from vehicle collisions would also be likely to occur.

**Raptors**
The buffer zones and seasonal construction restrictions would be required by UDWR in regard to active nest sites would prevent impacts to nesting raptors due to construction activities. Abundant foraging opportunities exist adjacent to the proposed project, thus limiting the impacts caused by the proposed new surface disturbance. The presence of a paved road would likely increase road kill in the area, resulting in an additional food source that could increase raptor populations in the area. However, the road would be fenced with 8-foot tall wire mesh fencing, to keep most larger mammals out of the road corridor. Further, small and large animal carcasses would be removed from the road daily to minimize potential scavenging on the roadway by raptors.

AMPHIBIANS
Impacts would occur to some, but not all, of the suitable amphibian habitat throughout the Quitchupah Creek drainage. Approximately 0.33 acres of wetlands and 1,140 feet of riparian zone in East Spring Canyon would be affected by the construction of the road. However, the wetland area, in which the Great Basin spadefoot toads were observed during the summer surveys, would not be disturbed. After construction, the paved road and increased traffic would cause increased mortalities to amphibians, especially after periods of rainfall when amphibians are most active and could venture onto the road. Species dependant upon Quitchupah Creek and East Spring Canyon creek would experience habitat fragmentation as a result of the road alignment. The creation and enhancement of 1.22 acres (net) of new wetlands would provide habitat to increase amphibian populations in the area, as would the new stream alignment.

REPTILES
New surface disturbance during construction activities would displace, kill, or injure reptiles within the area. After construction, the paved road and increased traffic would cause increased mortalities. Displaced reptiles would reestablish in undisturbed habitats away from the road.

MANAGEMENT INDICATOR SPECIES
Approximately 3.0 acres of sagebrush habitat out of approximately 380 acres in the vicinity would be affected by Alternative B. Displacement of sagebrush dependant migratory and resident species would likely occur. Very few sagebrush dependant species were observed during 2002 surveys (see Supplemental Technical Report); therefore, impacts to sagebrush dependant species would likely be minimal.

No spruce/fir/aspen forested areas, which are habitat for cavity nesters, would be impacted by Alternative B. No dedicated cavity nesting species surveys have been conducted within the Project Area.

Approximately 1.0 acre of riparian vegetation would be impacted by Alternative B. Although no dedicated surveys for riparian dependant bird species have been conducted in the Project Area, it is likely that some of these species would be displaced by construction of the road. The creation and enhancement of 1.22 (net) acres of new wetlands habitat and replacement of riparian in East Spring Canyon would

enhance the habitat from current conditions that may support a greater population of riparian dependant species. In addition, these wetlands would serve as sediment traps, enhancing overall water quality that would be beneficial to macroinvertebrate and fish species.

**ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN - ALTERNATIVE C**

Impacts to wildlife resources would be similar to those described for the Alternative B with the exception of impacts to big game and raptors. Under this alternative, underpasses to facilitate big game movements would be installed, reducing the potential impacts to big game caused by vehicle collisions. The box culvert underpasses would be designed to allow passage of deer and elk. In addition, this alternative would also reduce the susceptibility of raptors from vehicle collisions. Installation of the wildlife underpasses would presumably result in less road-killed wildlife for the raptors to feed on, thus decreasing the likelihood of raptors foraging on the road.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

Impacts to wildlife resources would be similar to those described for Alternative B, except that an additional 54 acres (bringing the total to 146.3 acres) of impacts to wildlife habitat would occur under this alignment. In addition, according to UDWR population counts, the Saleratus Benches appear to winter greater elk numbers than the Quitchupah drainage, so impacts to that species may be greater for this alternative than for Alternatives B or C. Since the road alignment across Water Hollow Benches would be fenced, deer and elk would be deterred from entering the road, thus reducing frequency of collisions with vehicles during winter months. Also, the loaded coal trucks would be traveling at slower speeds across these benches due to weight and road grade, while empty coal trucks would be ascending the grade, factors which allow drivers more time to avoid colliding with big game that do end up on the road.

Big game would, however, need to cross the road to reach summer/winter ranges. The movement of big game through these ranges would be affected by the placement of the five wildlife bridge crossings.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES B, C, and D**

A new wetland complex area would be created and one wetlands area would be enhanced to replace the wetlands and the hydric fringe along the realigned creek segments as a result of the construction of the roadway. One existing wetlands area would be enlarged and stabilized, the other would be created by diking perennial flows and forming shallow ponds with marsh borders. All of the water sources for the wetlands would be perennial natural flows. A total of 1.22 acres would be created (see Section 2.2). Species dependant on wetlands habitat including amphibians, birds, small mammals, and reptiles, may increase in population numbers. The replacement channel would provide all the habitat values of the original channel in East Spring Canyon.

Wildlife fencing would be installed on both sides of the road alignment to prevent big game access to the road corridor. The fencing would be 8-feet tall woven wire fence (See **Appendix B**). Escape structures would be provided every mile.

Although fencing is intended to restrict big game access to the road, the haul route would be patrolled daily, during daylight hours, to pick up and dispose of any animal carcasses (wild and domestic, large and small) in order to keep the road surface clear. As outlined in the Applicant Committed Measures in Chapter 2, this would reduce scavenging on the road surface by raptors and vultures. The Sevier County SSD would be responsible for removing carcasses to a specified disposal area in accordance with the regulations of the State Board of Health. The SSD or the SSD's contractor would secure and maintain any necessary license or permits required by State or local authorities to perform this service.

Continued monitoring of MIS species by the Fishlake National Forest would be conducted to ensure that the populations remain in stable conditions. Wetland sites, one enhanced site and one created site, the stream realignment and riparian zones in East Spring Canyon and reclamation of land disturbed by the road construction activities would be monitored to ensure revegetation efforts are met (see Chapter 2).

**MITIGATION SPECIFIC TO BUILD ALTERNATIVE D – WATER HOLLOW ROAD**

In addition to road fencing for wildlife as described above, five bridges have been recommended by UDWR for installation in selected drainages across the Water Hollow benches to allow for elk passage. The locations of these structures/culverts are shown on the strip maps in **Appendix B**; the design of these structures would meet the UDWR standards for minimum size and openness.

A conversion of 700 acres of pinyon-juniper woodlands at six sites on Water Hollow and Saleratus Benches would provide additional forage for elk and deer. These sites would be seeded and monitored with a goal of sufficient forage to maintain 400 elk and 100 deer during severe winters. These proposed seedings would move the elk and deer away from the road and provide adequate forage to maintain the present herds during winters of heavy snow. Proper management and manipulation of vegetation would improve forage for wildlife as well as livestock, while improving soil erosion and watershed conditions (BLM, 1991). BLM prescriptions for mechanical and burning treatments of vegetation as well as seeding can be found in the *Final Environmental Impact Statement Vegetation Treatment on BLM Lands in Thirteen Western States* (BLM, 1991).

A maximum of about 700 acres in eight locations could be seeded to provide additional forage for wintering elk (**Figure 2-13**). However, the four main soils on the benches have varying capacity to support grasses (see list below). The Travesilla soils support black sage, shadscale, and pinyon-juniper, so reseeding to grasses would not be as productive as the other soils and would require careful range management practices to maintain the reseeded grass community. Since most of the seeding sites are on the bench and mesa terrains, the Chupadera and Hernandez soils would support most of the seedings. The selected locations for reseeding are all downslope from the proposed road with adjacent thermal cover so big game using these seedings would not need to cross the road on a daily basis (**Figure 2-13**).

The Environmental Assessment for the seeding would tier off this EIS and BLM Vegetation EIS.

The dominant plants for each soil based on NRCS characteristic vegetation are as follows:

| | |
|---|---|
| Chupadera Series: | western wheatgrass, basin big sagebrush, Indian ricegrass, needle and thread grass, muttongrass |
| Gerst Series: | shadscale, Salina wildrye, galleta, western wheatgrass |
| Hernandez Series: | western wheatgrass, big sagebrush, Indian ricegrass, needle and thread, muttongrass |
| Travessilla Series: | black sagebrush, Indian ricegrass, galleta, shadscale |

**Table 3.5-1 Water Hollow Bench Soil Capabilities**

| Soil Series | Assumed Range Site | Assumed Forage dry weight lb/acre* | Present Plant Community | Desired Plant Community |
|---|---|---|---|---|
| Chupadera | Upland Loam | 1100 | big sagebrush | Grass |
| Gerst | Semidesert Shallow Clay | 550 | pinyon - juniper | Shrub-grass |
| Hernandez | Semidesert Loam | 700 | pinyon - juniper | Grass |
| Travessilla | Semidesert Shallow Loam | 400 | pinyon - juniper | Shrub |

*These forage production rates are for areas of improved management.

The range sites and forage weights in **Table 3.5-1** are based upon the best available information at this time, given that the soils survey for this area has not been finalized or published. Range sites may vary somewhat from the above depending upon the exact position in the landscape. For example, while Chupadera may occur either in an upland or a semidesert range site, the existing NRCS information indicates that the upland site is correct for this area, though new information could change that assumption. Field studies (see step 1 below) would result in refinement of range site descriptions and specific acreages of each soils to be seeded. Mid-level (normal year as opposed to best or poor years) forage values were used based upon NRCS information for the soils, and in any case should not be presumed to be anything other than a reasonable estimate based upon NRCS studies. To provide a conservative estimate of seeding benefit, it has been assumed that 80% of the soils in the proposed seedings have an average annual production of forage of 700 lb/acre dry weight and 20 percent would have a forage of 400 lb/acre dry weight. This results in an estimate of 640 lb/acre dry weight combined (**Table 3.5-1**). That would result in the 700 acres of seeding providing support to 230 elk/month. Since the seedings would only receive concentrated use during periodic heavy snow years, the use factor could jump to 80% without damaging the forage; the seedings could support 230 elk for 2 months in heavy snow years.

An additional 180 acres has potential for seeding on the Saleratus Bench to provide forage for approximately 60 elk for 2 months.

To provide the full forage potential of the seedings and the existing plant communities, spring cattle grazing would need to be managed carefully. Spring grazing of grasses removes early growth that then does not allow the plants to reach their full forage potential, which cannot be replaced prior to the winter season. For the best results, no grazing should occur on seeding areas for two full growing seasons (BLM, 1991).

The following steps would be taken in order to establish the seedings.

1. Field-verify the location of the Chupadera and Hernandez soils and adjust seeding locations as needed to maximize their coverage in the area to be seeded.
2. Determine area out of all the terrain suitable for seedings in the target areas.
3. Conduct cultural surveys and T&E plant species surveys on proposed seedings.
4. Remove, eliminate, or destroy all of the shrub and tree cover within the proposed seedings.
5. Broadcast hay mulch and fertilizer over the bare soil surface. (Fertilizer promotes the growth of seeded grasses over other plants.)

6. Drill seed mixture (**Table 3.5-2**) into terrain suitable for drilling. The action of the seed drill will turn the hay mulch and fertilizer into the mineral soil.
7. Broadcast seed in terrain not suitable for drilling and cover seed with harrow.
8. Establish photo points for monitoring.

**Table 3.5-2 Species Mixture for Wildlife Winter Range Seedings**

| Common Name | Latin Name | Amount |
|---|---|---|
| blue grama | *Bouteloua gracilis* | 2 lb/acre |
| western wheatgrass | *Pascopyrum smithii* | 5 lb/acre |
| muttongrass | *Poa fendleriana* | 3 lb/acre |
| Salina wildrye | *Agropyron salinii* | 4 lb/acre |
| needle and thread | *Stipa comata* | 4 lb/acre |
| alfalfa | *Medicago sativa* - var. *ladak* or *nomad* | 2 lb/acre |
| antelope bitterbrush | *Purshia tridentata* | 3 lb/acre |
| fourwing saltbush | *Atriplex canescens* | 3 lb/acre |
| Mormon tea | *Ephedra viridis* | 3 lb/acre |
| mountain mahogany | *Cercocarpus ledifolius* | 3 lb/acre |
| winterfat | *Krascheninnikovia lanata* | 3 lb/acre |
| Utah serviceberry | *Amelanchier utahensis* | 3 lb/acre |
| **TOTAL** | | **38 lb/acre** |

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

Depending on the Alternative selected, between 45 and 55 acres of permanent disturbance to habitat would occur as a result of the Proposed Action and Action Alternatives. Of the 92 to 146 acres of total disturbance that would occur as a result of the Proposed Action, between approximately 57 to 106 acres of habitat would be reclaimed based on which alternative is selected. Residual adverse impacts under Alternatives B, C, and D include habitat fragmentation and increased road kill.

**CUMULATIVE EFFECTS**

Past and present actions that have impacted wildlife include mining, road development, and construction of fencing along SR-10. Increased public access in the Quitchupah Creek area would occur as a result of the Proposed Action, which would increase noise and also disturbance to wildlife habitat. The reasonably foreseeable action of exploration and drilling of federal oil and gas leases may occur. Reclamation would occur on sites that do not enter into production.

The construction of fencing along Quitchupah Creek would impede wildlife movement in the area. Additional habitat fragmentation would likely occur due to continued road building, for developments such as gas or mineral exploration, possibly reducing small mammal, reptile, amphibian, and bird species populations along the Quitchupah Creek corridor. Applicant Committed Measures, discussed in Chapter

2 and earlier in this section, would prohibit grazing along 4.7 miles of riparian zones beginning two years from project approval. The protection of 4.7 miles of stream corridor would enhance the degraded riparian zone, increasing the extent and quality of wildlife habitats along the stream. The Salina Creek Vegetation Plan, on the fringes of the Cumulative Effects area in upper Broad Hollow, would manipulate the structure and composition of vegetation creating a mix of younger, more vigorous stands intermixed with mature vegetation (USFS, 2002). This project would contribute to improving forage and habitat conditions for wildlife and domestic livestock in the area.

## 3.6 Fisheries and Aquatic Resources

The following is a summary description of the existing affected environment for aquatic resources in Quitchupah Creek and lower Water Hollow Creek. A full description is presented in the Final Aquatic Resources Technical Report, Quitchupah Creek Road EIS (JBR, 2001c). Quitchupah Creek is classified as supporting cold water aquatic wildlife under beneficial use class 3A. Additional water resources information, including existing water quality data, is in **Section 3.2**.

**FLOW RATES**

Flow rate measurements were taken at two different times of the year for the Quitchupah stations and once in Water Hollow Creek. At the Quitchupah stations, the first set of flow rate measurements coincided with the fish electroshocking and macroinvertebrate sampling in July 1999 and the second set of flow rate measurements were taken in early October 1999 when flow rates were expected to be near the lowest of the year. The single flow rate measurement in Water Hollow Creek coincided with the fish electroshocking and macroinvertebrate sampling in November 2000. **Table 3.6-1** displays the flow rates from the sampling periods. The locations of the aquatic sampling stations are presented in **Figure 3-1**. For additional flow information, see **Section 3.2** Water Resources.

**Table 3.6-1 Flow Rate Measurements for Aquatic Sampling Stations**

| Stations | Flow Rates (cfs) | |
|---|---|---|
| | July | October or November |
| Quitch-01 | 3.0 cfs | 6.26 cfs* |
| Quitch-02 | 7.86 cfs | 6.00 cfs |
| Quitch-03 | 0.81 cfs | 0.70 cfs |
| Quitch-04 | 0.13 cfs | 0.10 cfs |
| WH-01 | not taken | 0.50 cfs |

* Increase in flow presumably caused by decrease in irrigation upstream of station and flow from Muddy Creek return canal into Quitchupah Creek (not flowing during July flow rate measurement).

**FISH SAMPLING**

Fish were only captured at the three lowest stations (Quitch-01, Quitch-02, and Quitch-03). No fish were captured at the highest stations, WH-01 and Quitch-04. A large natural waterfall barrier (>40 feet high) occurs in Quitchupah Creek upstream of both Quitch-03 and the confluence of Water Hollow, but downstream of Quitch-04. The waterfall presumably prevents fish from reaching the upper parts of the creek (Quitch-04) and associated tributaries above this point. However, the waterfall would not affect fish ability to reach WH-01 from QC-03, and it is not known why fish were not observed at WH-01 during the fish sampling in 2001. USFS personnel reported observing fish in Water Hollow in 2002.

A baseline fisheries study was conducted on Quitchupah, Water Hollow, and East Spring Canyon Creeks. A total of five stations were selected (Quitch-01 through Quitch-04 and WH-01) and sampled via electrofishing. The greatest diversity (4 species) and highest numbers of fish (142) were found at the

lowest station (Quitch-01). Speckled dace were the most common fish caught, occurring at three stations and in the highest number. In addition, speckled dace were the only species captured at stations Quitch-02 and Quitch-03. Additional electroshocking conducted by USFS personnel on Quitchupah Creek below the confluence with Water Hollow Creek, as well as Water Hollow Creek upstream from this confluence in August 2003 recorded only a few speckled dace. These same stretches were sampled again (electroshocked) in September 2004, with similar results; speckled dace were found to be more common in the Quitchupah Creek stretch than in Water Hollow Creek (Whelan, 2005 and 2004).

The UDWR noted finding bluehead sucker in Quitchupah Creek below the Project Area, at the confluence with Ivie Creek (Walker, 2005). Bluehead sucker were noted to be 'rare'. The bluehead sucker is on UDWR's Utah Sensitive Species list. Two other fish species listed on UDWR's Utah Sensitive Species List, the flannelmouth sucker and the leatherside chub, were caught during the surveys at the lowest station (Quitch-01).

**MACROINVERTEBRATE SAMPLING**

A range of between 10 to 16 different species of macroinvertebrates were found at the five stations sampled on Quitchupah, Water Hollow, and East Spring Canyon Creeks; station Quitch-01 had the lowest diversity and station Quitch-03 had the highest diversity of species. Quitch-04 (East Spring Canyon Creek) had the highest grams/square meter of the five stations. Not surprisingly, the highest number of macroinvertebrates was of those species with high tolerance quotients. The high tolerance quotients are a strong indication that the majority of species in Quitchupah Creek are accustomed to stressed environmental conditions. The Biotic Condition Index (BCI) data for these stations indicate that they are at or near their potential, and that given the existing stream and watershed conditions, these stations are about as good as expected. However, there is potential that the aquatic macroinvertebrate community could be degraded below current levels by eliminating the few intolerant and moderately tolerant taxa present, reducing the numbers of taxa, or by reducing their biomass. The Shannon-Weaver Index (used to measure the diversity of a community) results are typically higher than found within the project site when the community is in better condition. However, the lower results can easily be attributed to the minimum number of samples (3) taken.

Station Quitch-03 contains 16 taxa, many of which have low tolerance quotients. The lowest station Quitch-01 exhibits very few sensitive taxa. In fact, the single specimens of *Drunella doddsi* and *Isoperla* could have drifted down from above and are probably not indicators of established populations.

Station Quitch-04 contained many taxa that are indicators of a more lentic or slow flowing water habitat. Organisms such as the micro caddisfly family Hydroptilidae, the Odonata, *Argia* and *Cordulagaster* and the tiny clam shrimp, Ostracoda, indicate that the system is not a fast flowing creek. The system contains the relatively rare aquatic insects *Cordulagaster* (dragonfly) and *Oxyethira* (caddisfly).

WH-01 had four taxa that were not present in the Quitchupah stations. For three of these, their presence was essentially a factor of the season of collection (Baumann, 2000).

The results of the 1999 and 2000 sampling were compared with results from the 1980 to 1982 sampling (Winget, 1983) where applicable. No sampling had occurred previously in Water Hollow Creek and therefore no comparisons are made for station WH-01.

The Quitchupah Creek drainage was in about the same aquatic condition in1999 as it was in 1980-1982. Comparable stations showed similar diversity and BCI values. The organisms were essentially the same

and the species that were different exhibit similar tolerance quotients. Water Hollow Creek is in worse condition when compared to Quitchupah Creek, but is still in relatively good condition (Baumann, 2000).

**SEDIMENT SAMPLING**

During the data collection effort, sediment mobility and active erosion/deposition that affects habitat features was evident. A flash flood, with a peak just over bank full, occurred during the sampling, and the following day, one of the pools that had been selected for sampling was no longer present. The stream as a whole appears to be very active, and habitat features appear to undergo frequent modifications.

Riffles or runs were the most common feature observed; pools were much less prevalent in number, and where noted, were generally small, shallow, poorly formed, and did not tend to span the width of the channel. It appeared that many of the identified pools were low flow features only, and would not be identifiable in a high flow event. Perhaps related to the poor quality and low number of pools, and the active frequent modifications that the channel undergoes, pools with identifiable tails typical of salmonid spawning sites were minimal.

The most notable conclusion from the sampling was that, out of the 37 samples collected at the Quitchupah stations, all had greater than 30 percent fines (less than 6 Millimeters (mm)). Previous study of sediments in the bed of Quitchupah Creek has shown similar results. Over a two-year period in the early 1980s, Winget (1983) collected four stream bed sediment samples from two locations on Quitchupah Creek. One location was below the mouth of East Spring Canyon Creek, and the other was just upstream of the confluence with the North Fork. Information on sampling methodology, site selection, or other collection details is not available, but the particle size distribution data presented in the report indicate high levels of fine sediments at both stream locations. An examination of Winget's (1983) data show that, for the eight samples, the range in the percent smaller than 4.75 mm was 31 to 74 percent, and the average was 56 percent. The riffle samples from latest study showed essentially the same, with a range from 32 to 72 percent and an average of 50 percent.

Comparisons between the four stations could not be readily made due to the varying number of samples and due to the varying habitat types sampled within each reach. However, based upon the range of fines reported for only the riffle samples collected from each station, there was not an identifiable difference between stations. The prevalence of fines at the sampling stations is indicative of high sediment transport in the stream system.

## Potential Impacts To Fisheries

The Environmental Consequences of each Alternative, in regard to fisheries, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself. Water Hollow samples were generally similar to Quitchupah Creek samples. Any differences would not be expected to be statistically meaningful.

**REGULATORY**

Regulatory issues regarding potential aquatic impacts would be limited to those relating to wetlands issues (COE 404 process), and water quality issues (Clean Water Act as implemented by the Utah Division of Water Quality). The permitting for this project would require an individual 404 permit to mitigate loss of wetlands and filling in "Waters of the U.S." The sensitive fish species present are not afforded protection required under the ESA for Federally listed threatened or endangered species. The common speckled dace is not protected by law.

**POTENTIAL IMPACTS**

Impacts to, and issues on, resources related to aquatic resources are described in the Vegetation and Wetlands (**Section 3.4**) for impacts to wetlands and riparian zones; in the Water Resources (**Section 3.2**) impacts to water quality, flood plains, and related subjects; and in the Wildlife Resources (**Section 3.5**) impacts to species such as amphibians are discussed.

**NO ACTION - ALTERNATIVE A**

Selection of the No Action Alternative would not result in any change in direct, indirect, or cumulative impacts to aquatic resources in the Project Area. The new road would not be constructed in the Quitchupah Creek drainage or the adjacent Water Hollow Bench area. The existing road would remain as a sediment source to the stream, and the existing environment in the Quitchupah Creek drainage would continue for the near future. There would be no relief of grazing in the riparian zone.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**

Quitchupah Creek is currently an active stream that conveys significant amounts of sediment and dissolved solids, as reflected by the fish and macroinvertebrate species present in its waters, particularly in the lower reaches of the Project Area. Speckled dace are found in all the lower stream reaches, conditioned to the sediment laden waters and salinities. The high tolerance quotient and generally low biotic index in the macroinvertebrates community indicates an aquatic environment that is under stress. **Table 3.6-2** gives a summary of the macroinvertebrate community by station to indicate the poor condition of the aquatic ecosystem in Quitchupah Creek.

**Table 3.6-2 Macroinvertebrate Community Indicators**

| Station | CTQa[1] | Percent of BCI[2] | Condition of Ecosystem | 1980-81 CTQa | 1980-81 BCI |
|---|---|---|---|---|---|
| 01 | 87 | 86 | Poor | 78/97 | 103/82 |
| 02 | 77 | 97 | Fair | 82/92 | 95/102 |
| 03 | 67 | 112 | Good | - | - |
| 04 | 99 | 74 | Poor | - | - |
| WH-01 | 75 | 100 | Good | - | - |

1. Community Tolerance Quotients is average of community tolerance, high numbers indicate pollutant tolerance species dominate community.
2. Percentage of predicated stream condition, low percentage indicates poor condition of aquatic ecosystem.

As described further in water resources (**Section 3.2**), there would be some potential for increases in sedimentation and destabilization of Quitchupah Creek. Under unexpected circumstances (such as if a culvert were to fail during a greater-than-design event) where a pulse of sediment could be introduced, the highly tolerant species present in the stream system would be expected to absorb such an occurrence, as they do currently (for example, when tributaries dump heavily-laden storm water runoff into the stream).

Impacts to the aquatic resources as a result of increased traffic, transport of coal materials, fuels, etc. would not be expected during the normal course of use. In the event of a truck accident, coal and fuels could inadvertently be introduced to the stream. Should such an event occur in the vicinity of station Quitch-04, where the more unusual and specialized macroinvertebrates were found, any degradation of the habitat would likely impact them by rendering their habitat unsuitable. Under Alternative B the 8.9 miles of road are all in close association with the stream so the risk of a spill to the stream would exist anywhere along this proposed road. Aquatic habitat fragmentation could occur as a result of required crossings of the Proposed Road, therefore all culverts in fish habitat would be designed to allow for fish passage and 100-year flood events (**Appendix B** - BMPs).

The removal of livestock grazing from 4.7 miles of stream would protect the riparian zone and allow the plant community to expand and stabilize the streambanks and shade the water improving the aquatic habitat in the middle stretch of Quitchupah Creek and all of Convulsion Canyon.

The enhanced and created wetlands would trap sediments generated in the upper watersheds of Convulsion Canyon, thus, aiding water quality. The 1.22 acres of new wetlands would provide additional habitat for species of macroinvertebrates that favor the slow-moving waters.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**

Potential impacts to aquatic resources would generally be the same as for Alternative B, including the protection of 4.7 miles of stream corridor. As described in Water Resources (**Section 3.2**), the proximity of the road to the stream, the number of required crossings, and the risk to the stream from implementation of Alternatives B and C are similar. The road under this alternative is in close proximity to the stream for 7 of the 9 miles, somewhat less of a risk for spills than the proposed road.

The enhanced and created wetlands would trap sediments generated in the upper watersheds of Convulsion Canyon, thus, aiding water quality. The 1.22 acres of new wetlands would provide additional habitat for species of macroinvertebrates that favor the slow-moving waters.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

The Water Hollow Road alignment would be placed further away from Quitchupah Creek than either Alternative B or Alternative C. This would mean that any erosion that occurred as a result of road construction, or of failure of road features due to drainage or stability problems, would be less likely to affect Quitchupah Creek. Further, any spills of coal or fuels would be less likely to reach Quitchupah Creek than they would be under Alternative B or C. This alternative would avoid the majority of Quitchupah Creek, including its middle and lower reaches that are most susceptible to instability impacts. However, it is important to note that the existing two-track along Quitchupah Creek would remain open and in its current unstable state under this alternative, and would thus continue to contribute sediments to the stream. The applicant committed measure to install and maintain waters bars along the existing two-track road would help reduce sediment loading from that source. Water Resources (**Section 3.2**) discusses the net effect of building the Water Hollow alignment and leaving the two-track road. However, a spill at the Water Hollow crossing would affect this stream and reach Quitchupah Creek. This alternative would be in close proximity to the stream in Convulsion Canyon for about 2.1 miles where there would be a risk of spill to the stream. Livestock would be restricted from grazing along 4.7 miles of riparian area, which over time could improve aquatic habitat. Instream watering and riparian grazing in Quitchupah Creek on private lands will continue.

The enhanced and created wetlands would trap sediments generated in the upper watersheds of Convulsion Canyon, thus, aiding water quality. The 1.22 acres of new wetlands would provide additional habitat for species of macroinvertebrates that favor the slow-moving waters.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

No mitigation or monitoring, beyond what is described in **Section 3.2** Water Resources, the BMPs (**Appendix B**), and the Environmental Protection Measures, are necessary for the Proposed Action or build Alternatives. The Water Hollow crossing would allow for fish passage through installation of a bridge.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

An improved road design would help to minimize sedimentation and salt loading into the drainages from the existing environment. Truck accidents could introduce coal and fuel into the streams even with

mitigation and monitoring measures in place. This would produce residual adverse impacts to fisheries and aquatics from Alternatives B, C, or D.

**CUMULATIVE EFFECTS**
Past and present impacts to fisheries and aquatics include habitat degradation due to sediment loading and destabilization of Quitchupah Creek, creating the poor condition of the aquatic ecosystem. Increased public access to the Project Area as a result of the proposed road would produce cumulative impacts to fisheries and aquatic resources. These cumulative impacts would primarily occur from sediment loading/erosion impacts, salinity, or fuel spills generated by the public.

The increased flow of mine discharge water in North Fork has stabilized the flows in that tributary so fish would be able to inhabit more of the stream on a year-round basis. However, the irrigation diversions downstream of the North Fork junction can, during periods of dry years, deplete the flow of Quitchupah Creek so the aquatic habitat is degraded. The restoration of the 4.7 miles of riparian zones over time would improve the aquatic habitat.

## 3.7 Threatened, Endangered, and Sensitive Species

The area of analysis for special status species encompasses the Project Area. As required by the Endangered Species Act (ESA), a Biological Assessment (BA) has been prepared under separate cover and is on file at the Fishlake National Forest Office and the BLM Richfield Field Office in Richfield, Utah. The BA evaluates the potential effects of a Proposed Action on Federally listed threatened, endangered, proposed and candidate species, and determines whether any such species and habitat are likely to be adversely affected by the action. The species accounts and discussion of potential impacts on these species resulting from the Proposed Action and alternatives, as discussed below, are taken from the BA.

The USFS requires a Biological Evaluation (BE) for the assessment/summary of the effects of a Proposed Action on USFS Sensitive Species. The information presented below has been utilized by the USFS for preparing a BE of the Proposed Action and alternatives.

In the case of species which occur or may occur in the Project Area, and species which may be directly or indirectly affected by the Proposed Action or alternatives, a further evaluation of potential impacts was prepared.

**THREATENED, ENDANGERED, AND CANDIDATE SPECIES**
A total of 10 Federally protected plant and animal species and one candidate species were listed by the USFWS as having the potential to occur within Emery and Sevier Counties and are shown in **Table 3.7-1**. The following discussion evaluates the likelihood for these species to occur in the area, based on habitats present, known occurrences, and the results of dedicated surveys for these species. If a species is known to occur in the area or has the potential to occur, the potential impacts resulting from the Project on that species are discussed.

A literature search reviewed the preferred habitats, elevational ranges, and occurrence records for each of these species. Based upon this information, a determination was made regarding the potential for each species to occur within the Project Area, or to be directly or indirectly affected by the Proposed Action or alternatives (i.e. for the species to occur within the Action Area). The basis for these determinations is presented in the following discussion. In the case of species that clearly do not occur in the Project Area and have no potential to be directly or indirectly impacted by the Proposed Action or alternatives (e.g. plant species occurring only at high elevations), a "No Effect" determination was made.

In the case of species that occur or may occur in the Project Area and species that may be directly or indirectly affected by the Proposed Action or alternatives, a further evaluation of potential impacts was prepared.

**Table 3.7-1 Federally Listed and Candidate Species Potentially Occurring within the Project Area**

| Common Name | Specific Name | Federal Status |
|---|---|---|
| Jones Cycladenia | *Cycladenis humilis* var. *jonesii* | Threatened |
| Maquire Daisy | *Erigeron maguirei* | Threatened |
| Last Chance Townsendia | *Townsendia aprica* | Threatened |
| Barneby Reed-Mustard | *Schoenocrambe barnebyi* | Endangered |
| San Rafael Cactus (Despain Footcactus) | *Pediocactus despainii* | Endangered |
| Winkler Cactus (Winkler Footcactus) | *Pediocactus winkleri* | Threatened |
| Wright Fishhook Cactus | *Sclerocactus wrightae* | Endangered |
| Heliotrope Milkvetch | *Astragalus montii* | Threatened |
| Bald Eagle | *Haliaeetus leucocephalus* | Threatened |
| Mexican Spotted Owl | *Strix occidentalis lucida* | Threatened |
| Western Yellow-billed Cuckoo | *Coccyzus americanus occidentalis* | Candidate |

THREATENED AND ENDANGERED PLANTS

Several of the listed plant species which have the potential to occur in the Project Area are restricted to, or most commonly occur on, particular soil or geological formation types. Soils in the area are generally derived by deposits of Quaternary alluvium and gravel deposits. The Project Area cuts through numerous sedimentary geologic formations that include the Mesaverde Group and the Mancos Shale.

**Jones Cycladenia (*Cycladenia humilis* var. *jonesii*) - Threatened**

Welsh et al. (1987) refer to this species as a "gypsophile" (occurring on gypsum-derived soils), found on "semibarren tracts on geological formations with poor water relationships." The species occurs in Eriogonum-Ephedra mixed desert shrub, and juniper communities at 4,400 to 6,000 feet AMSL. As Welsh suggests, the species is found in gypsiferous, saline soils of the Cutler, Summerville and Chinle formations. Flowering occurs in May and June.

This species occurs at lower elevations than those found in the Project Area (4,400 to 6,000 feet vs. 6,000 to 7,600 feet in the Project Area) and on formations and soil types which do not occur in the area. Therefore, this species would not be expected to occur in the Project Area.

**Maguire Daisy (*Erigeron maguirei*) - Threatened**

This perennial daisy grows in canyon bottoms in Wingate and Navajo formations, at elevations of 5,380 to 5,700 feet (Welsh et al., 1987). Atwood et al. (1991) cite a higher elevational range, of between 5,600 and 7,200 feet. Cronquist et al. (1994) states that the species grows in cliff crevices and the sandy bottoms of washes. Flowering occurs in June and July. The species also occurs in cool, moist mesic

wash bottoms and dry, partially shaded slopes of eroded sandstone cliffs in the Wingate, Chinle, and Navajo sandstone formation or in dry, rocky, sandy canyon bottoms in the Navajo and Wingate Sandstone formations (Atwood et al., 1991).

The upper elevational range of this species, as reported by Atwood et al. (1991), is within the elevations of the Project Area and suitable habitat for this species (cliff crevices and the sandy bottoms of washes) does occur within the Project Area, but the geologic formations from which the species has been reported (Wingate, Chinle, and Navajo sandstone formations) are not found in the area. Therefore, this species is believed to be absent from the Project Area.

**Last Chance Townsendia (*Townsendia aprica*) - Threatened**
This species grows in salt desert shrub and pinyon-juniper habitats on clay or clay-silt exposures of the Arapien and the Blue Gate member of the Mancos Shale, at elevations between 6,100 to 8,000 feet (Welsh et al., 1987; Atwood et al., 1991). Flowering occurs in April and May. This species is known from locations near the Project Area (Section 13 of Township 22 South, Range 5 East) and habitat exists in portions of the project corridor. Field surveys in May 1999 and May 2003, however, did not find any occurrence of this species within the project corridor.

**San Rafael Cactus (*Pediocactus despainii*) – Endangered**
This species is generally solitary, though it may occur in colonies. Habitat for this cactus is open pinyon-juniper communities on limestone gravels, at an elevation of approximately 6,000 to 6,200 feet (Welsh et al., 1987; Atwood et al., 1991). Flowering occurs from late April to early May. The species occurs at elevations within those found in the Project Area (6,000 to 6,200 feet compared to 6,000 to 7,600 feet in the Project Area). Conversations with the Botanist for the BLM's Richfield Field Office, indicate that this species has the potential to occur within the Project Area (Armstrong, personal communication June 15, 1999); however, none were located during a May 1999 field visit.

**Winkler Cactus (*Pediocactus winkleri*) – Threatened**
This diminutive species, also known as the Winkler footcactus, is usually solitary. The species occurs in salt desert shrub communities at 4,800 to 5,200 feet AMSL, in fine textured, poor-quality saline substrates (Welsh et al., 1987). Flowering occurs in late March to mid-May.

The Winkler cactus generally occurs at elevations below that found in the Project Area. Although this species may be found near the lower boundary of the Project Area (Armstrong, personal communication June 15, 1999), a May 1999 field survey confirmed none were located within the Project Area.

**Heliotrope Milkvetch (*Astragalus montii*) - Threatened**
Welsh et al. (1987) states that the heliotrope milkvetch is known only from the Flagstaff Limestone on the Wasatch Plateau, at an elevation of approximately 11,000 feet. Atwood et al. (1991) cites the habitat for this species as being alpine areas in a mixed grass-forb community on windblown ridges and snowdrift sites, at elevations of 10,500 to 11,000 feet. Flowering occurs July to August. The heliotrope milkvetch would not be expected to occur in the Project Area, where elevations reach only about 7,600 feet.

**Barneby Reed-Mustard (*Schoenocrambe barnebyi*) - Endangered**
Welsh et al. (1987) report that the Barneby reed-mustard occurs in mixed shadscale, *Eriogonum* and *Ephedra* communities in the Chinle Formation between approximately 5,600 and 5,700 feet AMSL. Flowering occurs in May.

This species occurs at elevations below those found in the Project Area and on soils derived from the Chinle Formation, which does not occur in the Project Area. The species is thus not expected to occur within the Project Area.

**Wright Fishhook Cactus (*Sclerocactus wrightae*) - Endangered**
Habitat for this species is salt desert shrub and shrub-grass to juniper communities on the Mancos Shale (Blue Gate, Tununk, Emery and Ferron members), Dakota, Morrison, Summerville, and Entrada formations, at elevations of between 4,800 to 6,100 feet (Welsh et al., 1987). Flowering occurs in April to May.

The small yellowish (to pink or white dorsally) flowers and short spines are diagnostic. Recorded locations of this plant in the project vicinity are south of I-70 and east of the Project Area on the San Rafael Swell, but not west of SR-10. Intermediates with Whipple fishhook (*S. whipplei*) occur occasionally in Emery County near the Sevier County line at the boundary between shale and sandstone members of the Mancos Shale Formation. This species has been found in soils not in the Project Area, but at elevations that coincide with the Project Area elevation (4,800 to 6,100 feet vs. 6,000 to 7,600 feet in the Project Area). However, the Wright fishhook cactus was not observed during a May 1999 field survey.

THREATENED AND ENDANGERED WILDLIFE
Only three Federally listed wildlife species were identified by the USFWS has having the potential to occur within the Project Area. All three species are birds. They include: the bald eagle, Mexican spotted owl, and western yellow-billed cuckoo.

**Bald Eagle (*Haliaeetus leucocephalus*) - Threatened**
The bald eagle is also known as the American eagle, black eagle, fishing eagle, gray eagle, Washington eagle, white-headed eagle, and white-headed sea eagle (Terres, 1980). During their breeding season, bald eagles are closely associated with water occurring along coasts, lakeshores, or riverbanks, where they feed primarily on fish. Bald eagles typically nest in large trees, primarily cottonwoods (*Populus* sp.) and conifers, although they have also been known to nest on projections or ledges of cliff faces (Call, 1978). Due to the large size of their nests, bald eagles usually build these structures in a tree which is the largest or stoutest in the immediate vicinity (Call, 1978). Two characteristics common to most nesting sites are a clear flight path to at least one side of the nest and excellent visibility, often with an unobstructed view of water. Most nests are in the top third of a living tree, with live foliage above the nest providing shade and protection during poor weather (Green, 1985). Breeding territories, including the nest tree and favored nearby perches, are defended against other eagles. Alternate nests are also common within the territory. Breeding territories are typically 250 to 500 acres in size (Swenson et al., 1986).

No bald eagle nests are known to occur within or in the general vicinity of the Project Area. Most sightings have been made in the Joes Valley Reservoir and Huntington Canyon areas, the closest of which (Joes Valley Reservoir) is approximately 20 miles north of the Project Area (USDA-USFS, 2000). A bald eagle nest has been reported in the vicinity of Castle Dale, approximately 20 miles northeast of the Project Area boundary. No roost sites have been found in the Project Area, and bald eagles are not expected to occur in the area except as transient birds, most commonly occurring in the winter months.

**Mexican Spotted Owl (*Strix occidentalis lucida*) - Threatened**
The Mexican spotted owl (MSO) is the only subspecies of spotted owl that occurs in Utah. The owl is known to nest only in steep-walled canyons of the Colorado Plateau eco-region and adjacent portions of the Utah Mountains eco-region. The closest known nest site to the area is located approximately 40 miles east, at the north end of Capitol Reef National Park.

According to the 14 August 2002 federally protected species by county list for Utah, MSOs are not listed in Sevier County, but are listed in Emery County. Potentially suitable habitat does occur within portions of the Project Area within Sevier County, but not within the portions of the Project Area within Emery County. Nonetheless, dedicated surveys for the MSO were conducted according to USFWS protocol, a total of four times in May and June of 2002. No MSOs were detected during these surveys.

**Western Yellow-billed Cuckoo (Coccyzus americanus occidentalis) - Candidate**
In Utah, the yellow-billed cuckoo was historically uncommon to rare. Habitat for this species in Utah typically consists of large blocks (20+ acres) of riparian habitat that includes cottonwood trees below an elevation of 6,000 feet (personal communication between Fishlake National Forest and USFWS on September 5, 2001). Two recent breeding records in Utah have been documented: one on the Green River in 1992 and the second within the Matheson Wetland Preserve near Moab in 1994 (USFWS 12-month petition finding July 25, 2001). Three yellow-billed cuckoos were also recorded during an intensive survey effort conducted throughout the Salt Lake Valley prior to 1988. Dedicated surveys for the yellow-billed cuckoo were not required because habitat for this species is essentially nonexistent within the area. There are no 20+ acre blocks of riparian deciduous forest in or near the Project Area. Subsequently, the yellow-billed cuckoo is not expected to occur in the Project Area or general vicinity.

SENSITIVE SPECIES
Each land management agency maintains their own region-specific sensitive species lists. The purpose of the listings for sensitive species is to identify those species in the managed area that are the most vulnerable to population or habitat loss. Typically, the conservation strategies recommend that proposed developments avoid sensitive species and their habitat so as not to render the species potentially threatened or endangered species under the ESA. The sensitive listed species are not afforded protection required under the ESA for Federally listed threatened or endangered species. Based upon agency consultation, it has been determined that the sensitive species shown in **Table 3.7-2** have the potential to occur within the Project Area.

Under Policy Number W2AQ-4, the UDWR also develops and maintains a list of sensitive species. Designated as the Utah Sensitive Species List, it identifies sensitive species as belonging to one of the following defined categories: extinct, extirpated, State-endangered, State-threatened, of special concern, or conservation species.

In addition, the Utah Natural Heritage Program maintains a list of "rare" species. Several of the listed rare species are also land management agency sensitive species and are addressed below. However, those species that are not sensitive are not afforded protection under the ESA or any land management agency conservation strategy and are, therefore, not discussed further.

**Table 3.7-2 USFS, BLM, & UDWR State Sensitive Species Potentially Occurring in the Project Area**

| Common Name | Specific Name |
|---|---|
| **Fishlake National Forest Sensitive Species** | |
| Elsinore Buckwheat | *Eriogonum batemanii var. ostundii* |
| Ward Beardtongue | *Penstemon wardii* |
| Sevier Townsendia | *Townsendia jonesii var. lutea* |
| Rabbit Valley Gilia | *Gilia caespitosa* |

| Common Name | Specific Name |
|---|---|
| **Fishlake National Forest Sensitive Species** | |
| Elsinore Buckwheat | *Eriogonum batemanii var. ostundii* |
| Townsend's Big-eared Bat | *Corynorhinus townsendii* |
| Spotted Bat | *Euderma maculatum* |
| Peregrine Falcon | *Falco peregrinus* |
| Northern Goshawk | *Accipiter gentiles* |
| Flammulated Owl | *Otus flammeolus* |
| Northern Three-toed Woodpecker | *Picoides tridactylus* |
| Colorado Cutthroat Trout | *Oncorhynchus clarki var. pleuriticus* |
| **BLM Richfield Field Office Sensitive Species** | |
| Basalt Milkvetch | *Astragalus subcinereus var. basalticus* |
| Flannelmouth sucker | *Catostomus latipinnis* |
| Leatherside chub | *Gila copei* |
| **UDWR State Sensitive Species** | |
| Bluehead sucker | *Catostomus discobolus* |
| Flannelmouth sucker | *Catostomus latipinnis* |

FISHLAKE NATIONAL FOREST SENSITIVE SPECIES

**Elsinore Buckwheat (*Eriogonum batemanii var. ostundii*)**

Elsinore buckwheat, endemic to Piute and Sevier Counties, is known to occur within shadscale, mixed desert shrub, sagebrush, juniper, and ponderosa pine communities (Atwood et al., 1991). This species usually occurs on igneous gravels between 5,495 to 6,512 feet in elevation. Flowering occurs from July to September.

No igneous gravels occur within the general vicinity and therefore, this species is believed to be absent from the area.

**Ward Beardtongue (*Penstemon wardii*)**

Ward beardtongue, endemic to Sanpete, Millard, and Sevier Counties, is known to occur within desert shrub, pinyon-juniper, shadscale, sagebrush, and greasewood communities on the Bald Knoll and Arapien Shale formations (Atwood et al., 1991). This species usually occurs between 5,495 to 6,810 feet in elevation. Flowering occurs from May to July.

Neither of the two formations on which this species is usually found occurs within the area; thus it is believed to be absent from the area.

**Sevier Townsendia (*Townsendia jonesii* var. *lutea*)**

Sevier townsendia, endemic to the Great Basin, is known to occur within desert shrub and juniper communities on Arapien shale and clays in volcanic rubble (Atwood et al., 1991). This species usually occurs between 5,500 to 6,000 feet in elevation. Flowering occurs from May to June.

Arapien shale and clays in volcanic rubble do not occur in the Project Area, therefore the species is not expected to occur within it.

**Rabbit Valley Gilia (*Gilia caespitosa*)**
Rabbit Valley gilia, endemic to Utah in Wayne County, is known to occur within pinyon-juniper communities on the Carmel and Navajo formations (Atwood et al., 1991). This species usually occurs between 5,200 to 8,515 feet in elevation. Flowering occurs from June to July.

The Carmel and Navajo formations do not occur in the Project Area. In addition, the Project Area does not occur within Wayne County, the only county in which this species has been discovered to date. Therefore, this species is not expected to occur within the Project Area.

**Townsend's Big-eared Bat (*Corynorhinus townsendii*)**
The Townsend's big-eared bat is also known as Western big-eared bat, western long-nosed bat, and western lump-nosed bat (Kunz and Martin, 1982). This species ranges throughout North America from British Columbia to central Mexico, with isolated populations reaching the Ozarks and Appalachia (Pierson et al., 1991). This bat occurs in juniper-pine forests, shrub-steppe grasslands, deciduous forests, and mixed coniferous forests from sea level to 10,000 feet in elevation (USDA-USFS, 1991). Although this species occurs in a variety of habitats and appears to be an adaptable forager, it is generally thought to be a moth specialist (Kunz and Martin, 1982). Townsend's big-eared bats are considered to be so sensitive to human disturbance that simple entry into a nursery roost can induce site abandonment by a colony (Humphrey and Kunz, 1976). According to Pierson et al. (1991) and Brown and Berry (1991), mine shafts/adits are the most important roosting habitat for Townsend's big-eared bats and other sensitive bat species, and should be protected from human disturbance where possible.

In 1992, Townsend big-eared bats were found using inactive coal mines as hibernacula on the Ferron Ranger District. They have also been found roosting in buildings of the Ferron/Price Ranger District in the town of Ferron during late summer of 1992. In the summer of 1997, bat surveys were conducted by Genwal Resources Incorporated in areas within Huntington Canyon (Crandall Canyon, Biddlecome Hollow, Tie Fork, Huntington Canyon, Mill Fork, and Bear Creek Canyon), approximately 25 to 30 miles north of the Project Area. No Townsend's Big-eared bats were located in those areas (Johansson et al., 1997).

Dedicated bat surveys in Quitchupah Creek have not been conducted; however, surveys in 1997 in Link Canyon (Perkins and Peterson, 1997) detected no big-eared bat use of the area. Perkins and Peterson concluded potential for the occurrence of big-eared bats in the area was low, and suitable big-eared bat habitat was not present.

**Spotted Bat (*Euderma maculatum*)**
This species is also known as the pinto bat (Watkins, 1977). Spotted bats occur in a variety of habitats including open ponderosa pine (*Pinus ponderosa*), desert scrub, pinyon-juniper, and open pasture and hay fields (Leonard and Fenton, 1983). Most often, they are found in dry, rough desert terrain (Watkins, 1977). Spotted bats roost alone in rock crevices high up on steep cliff faces. They have been recorded from 187 feet below sea level to the high transition zone of Yosemite National Park (Goodwin and Holloway, 1972). Critical roosting sites are cracks and crevices from 0.8 to 2.2 inches in width in limestone or sandstone cliffs (USDA-USFS, 1991). Spotted bat populations may be limited by the availability of suitable roosting sites. Generally, spotted bats are found in relatively remote, undisturbed areas, suggesting that they may be sensitive to human disturbance (USDA-USFS, 1991).

In the summer of 1997, surveys conducted by Genwal Resources Incorporated detected spotted bats utilizing habitats within Mill Fork Canyon, Crandall Canyon, Biddlecome Hollow, Tie Fork, Huntington Canyon, and Bear Creek Canyon, approximately 25 to 30 miles north of the Project Area. Foraging areas were located at relatively low elevation sites associated with riparian vegetation within Huntington Canyon. Specific individual roost sites were not located, but general roosting areas were identified on the cliff faces/rock outcrops in Crandall and Mill Fork Canyons. Additional roosting areas were identified throughout the Huntington Canyon drainage among sizeable cliff faces (Johansson et al., 1997).

Other known observations of spotted bats on the Ferron/Price Ranger District have been at Joes Valley Reservoir and at Emerald Lake. Surveys by Perkins and Peterson (1997) documented spotted bat use in Link Canyon; however, no surveys have been conducted within the Project Area.

**Peregrine Falcon (*Falco peregrinus*)**
The peregrine falcon is a wide ranging species which utilizes a variety of habitats. Peregrines usually nest on large rock cliffs in open country; preferred sites overlook water and allow an extensive view of the surrounding terrain (Herron et al., 1985). In the Rocky Mountain southwest, the walls of canyons and gorges are often used for nest sites (Call, 1978). Reintroduced birds regularly nest on man-made structures such as towers and high-rise buildings (USDA-USFS, 1991). Peregrine falcons use riparian areas for hunting (McCarthy et al., 1986) and often hunt birds that frequent undergrowth or occupy coniferous forest habitats (Craig, 1986). The most frequently used nesting cliffs exceed 100 feet in height, are often at the top of a high talus slope, and have ledges or caves with gravelly or sandy floors. Peregrines nest directly on this material in a shallow depression or scrape (Call, 1978).

The closest known peregrine falcon eyrie, located in Link Canyon approximately five miles to the north, was found active in 1997; however, the eyrie has not been active since that time based upon surveys conducted by UDWR in 1998 and 1999.

**Northern Goshawk (*Accipiter gentilis*)**
In most areas, the northern goshawk occupies montane forests in spring and summer, with some altitudinal migration into foothills and valleys in the winter (Terres, 1980). Nest trees of this species are commonly located on benches or basins surrounded by much steeper slopes (Call, 1978). The goshawk usually nests on a horizontal branch next to the trunk of mature conifers, aspen (*Populus tremuloides*), cottonwood, or other deciduous stream bottom trees (Call, 1978), about 20 to 60 feet up in the tree canopy (Terres, 1980). Reynolds (1983) found nests in Oregon were generally located in multi-layered, mature, or old-growth coniferous forest. Nests were usually located near water, on areas of moderate slope, often with a northerly aspect. Forest openings were generally located nearby. The same nest may be used for several seasons, but alternate nests are common within a single territory. Adjacent understory is usually fairly open (Call, 1978). This large accipiter usually requires an extensive home range (Johnsgard, 1990). Goshawks are very protective of their young in the nest and loudly defend them against intruders. They are very sensitive to human disturbance and have abandoned nests and young due to human activities that take place too close to their nest (Kennedy and Stahlecker, 1989; Hennessey, 1978). Goshawks are not known to nest within the Quitchupah Creek canyon or Water Hollow Project Areas; dedicated surveys were deemed unnecessary because of limited suitable habitat. However, goshawks could occasionally use portions of the Project Area for foraging opportunities.

**Flammulated Owl (*Otus flammeolus*)**
This diminutive owl, approximately six inches in length, inhabits the montane coniferous forests of North and Central America, ranging from southern British Columbia to Guatemala (Ryser, 1985). In most areas, this owl occurs in close association with ponderosa pine (*Pinus ponderosa*) and Jeffery pine (*Pinus*

*jefferyi*), though it has been recorded less commonly in other forest types (Johnsgard, 1988). This small and secretive owl is a cavity nester, and thus requires natural or woodpecker-excavated cavities as a component of its habitat. Flammulated owls are almost exclusively insectivorous, preying on small to medium sized moths, beetles, caterpillars, and crickets (Reynolds and Linkhart, 1987; Johnsgard, 1988; Bull et al., 1990). Like most insectivores, but unlike most owls, flammulated owls are migratory (Winter, 1974; Balda et al., 1975; Collins et al., 1986; Gaines, 1988).

Flammulated owls have been found in the Quitchupah Creek drainage on the Old Woman Plateau, located at the upper, western end of the Project Area. Suitable habitat, although limited, does occur within and adjacent to the Project Area.

**Three-toed Woodpecker (*Picoides tridactylus*)**
The three-toed woodpecker is a permanent resident of the taiga or circumboreal forests of Eurasia and North America, ranging southward into the continental United States (Ryser, 1985). The species is found in northern coniferous and mixed forest types up to 9,000 feet elevation. Forests containing spruce, grand fir, ponderosa pine, tamarack and lodgepole pine are used. Nests may be found in spruce, tamarack, pine, cedar, and aspen trees. Three-toed woodpeckers forage mainly on dead trees, although they will feed in live trees. About 75 percent of their diet is woodboring insect larvae, mostly beetles, but they also eat moth larvae. Three-toed woodpeckers are major predators of the spruce bark beetle, especially during epidemics.

Three-toed woodpeckers are known to occur in the general area from dedicated surveys conducted during 1992 through 1996 throughout suitable habitat in adjacent forested areas. Limited habitat occurs within or adjacent to the upper portions of the Project Area.

**Colorado Cutthroat Trout (*Oncorhynchus clarki* var. *pleuriticus*)**
This species requires clear, cool water. Optimum habitat consists of suitable 1:1 pool to riffle ratio and slow, deep water with vegetated streambanks for shade, bank stability, and cover. This species could also inhabit lakes. Habitat for this species is not found within the Project Area. Furthermore, electroshocking in Quitchupah and lower Water Hollow creeks provided no evidence that these species would occur in the area (JBR, 2001c).

BLM RICHFIELD FIELD OFFICE SENSITIVE SPECIES
**Basalt Milkvetch (*Astragalus subcinereus var. basalticus*)**
The Basalt milkvetch is known to occur within pinyon-juniper and ponderosa pine communities between 4,520 to 7,970 feet elevation (Atwood et al., 1991). Because the appropriate habitat and the Mancos Shale formation for this species does occur within the Project Area, preconstruction surveys for this species will be conducted during appropriate flowering times in the spring/summer prior to construction activities in suitable habitat.

UDWR UTAH SENSITIVE SPECIES LIST
The UDWR Utah Sensitive Species List includes several fish species that are endemic to the Colorado River Basin in which the Project Area occurs, or whose known historical range does not exclude the Project Area. These species are: bonytail (*Gila elegans*), Colorado squawfish (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), woundfin (*Plagopturus argantissumus*), Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), roundtail chub (*Gila robusta*), leatherside chub (*Gila copei*), flannelmouth sucker (*Catostomus latipinnus*), bluehead sucker (*Catostonus discobolus*), Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), Bonneville cutthroat trout (*Oncorhynchus clarki utah*), Virgin spinedace (*Lepidomeda mollispinis*), and least chub (*Iotichthys phlegethontis*). The flannelmouth sucker and leatherside chub are also on the BLM sensitive species list.

The bluehead sucker and flannelmouth sucker are covered under a Range-Wide Conservation Agreement (UDWR, 2004) under which several western states have agreed to work cooperatively on conservations measures to ensure the persistence of these species.

As discussed in more detail in the Final Aquatic Resources Technical Report (JBR, 2001c), two of these listed fish species were found in Quitchupah Creek during July 1999 fish sampling. At one out of five total locations that were electroshocked, 13 individual flannelmouth suckers and one leatherside chub were captured. At the other four locations, these species were absent. During 2004 surveys, flannelmouth suckers were determined as 'not present' in Quitchupah Creek (UDWR, 2005a). None of the other fish species on the Utah Sensitive Species List were found during the fish sampling. However, the bluehead sucker was found during a separate survey by UDWR at the confluence of Quitchupah Creek with Ivie Creek.

## Potential Impacts To Threatened, Endangered, And Sensitive Species

The Environmental Consequences of each Alternative, in regard to TES species, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

### REGULATORY

The BA has been reviewed and approved by the USFWS (**Appendix F**). A Biological Opinion was not required as the determination was that none of the threatened or endangered plant or animal species or habitat would be impacted or adversely affected by the proposed project. Similar review and approval of the BE by the USFS was conducted. Appropriate environmental measures as outlined in Chapter 2 and monitoring as detailed in Monitoring Plan would be implemented if sensitive species might be impacted by the proposed project.

### POTENTIAL IMPACTS TO SPECIAL STATUS SPECIES

This assessment evaluates the potential for each Special Status Species to be directly or indirectly impacted by the Alternatives. This assessment is based on a review of the species' preferred habitats and their recorded occurrence. Based upon this information, a determination can be made regarding the potential for each species to be directly or indirectly affected by the Alternatives.

In the case of species that clearly do not occur in the Project Area and have no potential to be directly or indirectly impacted by the Alternatives (plant species occurring at elevations outside that of the Project Area, for example), a "No Effect" (in the case of listed species) or "No Impact" (in the case of Sensitive Species) determination was made. In the case of species that occur or may occur in the Project Area and which may be directly or indirectly affected by the Alternatives, a further evaluation of potential impacts was prepared.

### NO ACTION ALTERNATIVE - ALTERNATIVE A

Selection of the No Action Alternative would not result in any direct, indirect, or cumulative impacts to Federally listed or sensitive species occurring in the Project Area. The road would not be constructed in the Quitchupah Creek drainage or the Water Hollow Benches area, and thus related disturbances would not occur in those areas. The existing land uses and environment in the Quitchupah Creek drainage would continue for the near future.

## QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B

### Threatened, Endangered, and Candidate Species

**Table 3.7-3,** developed from the BA, summarizes the occurrence and effects analysis for threatened, endangered, and candidate species potentially occurring in the Project Area. This table includes the rationale for the determinations shown.

Dedicated surveys for the Mexican spotted owl, following USFWS protocol, were conducted within the Project Area in May and June of 2002 (JBR, 2002 Technical Addendum). Surveys were conducted in suitable nesting habitat on Alternatives B and D. No Mexican spotted owls were detected or observed during these surveys.

Wintering bald eagles may utilize the roadway for the scavenging of big game road kill. This would lead to potential collisions of bald eagles with coal trucks. As outlined the Applicant-Committed Environmental Protection Measures in Section 2.2, all animal carcasses would be removed daily from the roadway to minimize the potential of bald eagle collisions with coal trucks.

### Sensitive Species

**Table 3.7-4** summarizes the occurrence and effects analysis for Sensitive Species potentially occurring in the Project Area. The table also includes the rationale for the determinations shown.

Limited suitable habitat for the northern goshawk, flammulated owl, and three-toed woodpecker would be impacted. In addition, approximately 1.0 acre of riparian habitat and .33 acres of wetlands, potential foraging habitat for spotted bats, northern goshawks, and flammulated owls that would be disturbed during construction would be replaced. Blasting during road construction activities could also temporarily impact spotted bats (if present) as potential roosting sites could be destroyed or disturbed. Dedicated surveys for these species were not requested by the Fishlake National Forest as little suitable habitat was in or adjacent to the Project Area.

Impacts to potentially suitable habitat for the Basalt milkvetch could occur. However, direct impacts to this species should not occur, as preconstruction surveys would identify the location of these species within proposed disturbance areas and appropriate mitigation measures would be implemented to avoid potential impacts.

## ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN - ALTERNATIVE C

Similar impacts to Federally listed and sensitive species would occur as described for Alternative B. However, the likelihood of impacts to habitat for *Townsendia aprica* is increased.

**Table 3.7-3 Potential Occurrence and Effects Analysis of Federally Listed Species - Summary of BA**

| Species | ALT A | ALT B | ALT C | ALT D | RATIONALE |
|---|---|---|---|---|---|
| Jones Cycladenia | NE | NE | NE | NE | Not known to occur in the Project Area; geologic formations on which this species occurs do not occur in the Project Area. |
| Maguire Daisy | NE | NE | NE | NE | Not known to occur in the Project Area; geologic formations on which this species occurs do not occur in the Project Area. |
| Last Chance Townsendia | NE | MA-NLAA | MA-NLAA | NE | Suitable habitat near Project Area, but not discovered during dedicated surveys. No critical habitat has been designated for this species. |
| Barneby Reed-Mustard | NE | NE | NE | NE | Not known to occur in the Project Area; geologic formations on which this species occurs are not found in the Project Area. |
| San Rafael Cactus | NE | MA-NLAA | MA-NLAA | MA-NLAA | Not known to occur within the Project Area. No critical habitat has been designated for this species. |
| Winkler Cactus | NE | NE | NE | NE | Not known to occur within the Project Area. No critical habitat has been designated for this species. |
| Wright Fishhook Cactus | NE | NE | NE | NE | Not known to occur within the Project Area. |
| Heliotrope Milkvetch | NE | NE | NE | NE | Not known to occur in the Project Area. |
| Bald Eagle | NE | MA-NLAA | MA-NLAA | MA-NLAA | Does not make regular use of the Project Area; construction impacts would not alter the limited use. Animal carcasses would be removed daily from the roadway but still may attract foraging eagles. No critical habitat has been designated for this species. |
| Mexican Spotted Owl | NE | NE | NE | NE | Suitable habitat near Project Area, but none were discovered during 2002 dedicated surveys. |
| Yellow-billed Cuckoo | NE | NE | NE | NE | Does not occur in Project Area. |

**NE** = No Effect
**MA-NLAA** = May Affect -Not Likely to Adversely Affect
**MA-LAA** = May Affect -Likely to Adversely Affect
**BE** = Beneficial Effect

**Table 3.7-4 Potential Occurrence and Effects Analysis of Sensitive Species - Summary of BE**

| Species | ALT A | ALT B | ALT C | ALT D | RATIONALE |
|---|---|---|---|---|---|
| Elsinore Buckwheat | NI | NI | NI | NI | Not known to occur in the Project Area; suitable habitat not present. |
| Ward Beardtongue | NI | NI | NI | NI | Not known to occur in the Project Area; suitable habitat not present. |
| Sevier Townsendia | NI | NI | NI | NI | Not known to occur in the Project Area; suitable habitat not present. |
| Rabbit Valley Gilia | NI | NI | NI | NI | Not known to occur in the Project Area; suitable habitat not present. |
| Townsend's Big-eared Bat | NI | MIIH | MIIH | MIIH | Not recorded in Project Area, but suitable roosting and habitat may be present. |
| Spotted Bat | NI | MIIH | MIIH | MIIH | Not recorded in Project Area, but suitable roosting and foraging habitat occurs in Project Area. |
| Peregrine Falcon | NI | NI | NI | NI | Known eyrie in Link Canyon area, approximately 5 miles to the north, not recorded in Project Area. |
| Northern Goshawk | NI | MIIH | MIIH | MIIH | Not recorded in Project Area, but suitable foraging habitat occurs in general area. |
| Flammulated Owl | NI | MIIH | MIIH | MIIH | Limited available habitat in area, foraging areas could be impacted. |
| Northern Three-toed Woodpecker | NI | MIIH | MIIH | MIIH | Known to occur in general area, available habitat could be impacted. |
| Colorado Cutthroat Trout | NI | NI | NI | NI | Does not occur in Project Area; historic range includes North Fork. |
| Basalt Milkvetch | NI | MIIH | MIIH | MIIH | Unknown to occur within the Project Area; however low potential suitable habitat does occur; preconstruction surveys would be conducted. |

**NI** = No Impact **BI** = Beneficial Impact
**MIIH** = May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or of Viability to the Population or Species
**WIFV** = Will Impact Individuals or Habitat with a Consequence such that the Action May Contribute to a Trend Toward Federal Listing or Loss of Viability to the Population or Species

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**
Similar impacts to Federally listed and sensitive species would occur as described for Alternative B.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**
As outlined in the Applicant Committed Measures in Chapter 2, the haul route would be patrolled daily, during daylight hours, to pick up and dispose of all animal carcasses (wild and domestic, large and small) in order to keep the road surface clear. This would reduce scavenging on the road surface by raptors and vultures.

Mitigation for the creation and enhancement of wetlands and riparian zones described in Section 2.2 would be identical for all Alternatives, and in the case of wetlands would provide additional habitat for wildlife. The agency-committed environmental protection measure of eliminating livestock grazing on 4.7 miles of stream would restore the degraded riparian zone, providing additional quality habitat for wildlife.

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**
No irreversible commitment of habitats for TES species are anticipated to occur as a result of the Alternatives. An increase in noise levels and human activity would occur within the Alternatives area as a result of vehicle travel. No residual adverse impacts were identified for TES species within the Alternatives area.

**CUMULATIVE EFFECTS**
Past range improvements, such as the reservoir on Saleratus Bench, has provided a water source that benefits certain TES species. Increased public access would occur as a result of the Alternatives, which would increase noise and also disturbance to TES species' habitat. Increased hunting could occur as a result of increased public access. Reasonably foreseeable activities could include federal oil and gas lease exploration and drilling. Reclamation would occur on drilling sites that do not enter into production. A producing gas field would require additional roads increasing access to lands within the watershed.

The removal of livestock grazing on 4.7 miles of stream corridor would protect the riparian plant community allowing it to reach its full potential along this stretch of Quitchupah Creek, this would provide additional habitat for many TES species including spotted bats.

## 3.8 Range Resources

There are five grazing allotments within the Project Area; E. Olsen, G.L. Olsen, Johnson, Quitchupah, and Saleratus. Livestock winter on the lower rangeland slopes adjacent to SR-10 and/or on the nearby irrigated fields, then move up the Quitchupah Creek canyon to a State-owned land section for spring grazing. Quitchupah Creek serves as the source of water for livestock in the winter and spring and again in the fall. In the late spring, livestock are trailed up the creek to summer pasture on the Fishlake National Forest, outside of the Project Area. Cattle return to Quitchupah Creek in the fall and trail down to winter pastures. In order to travel to and from summer pastures, the cattle must cross the Acord Lakes Road in Convulsion Canyon near Broad Hollow. Livestock also graze along this paved road, and an unknown number of cattle are killed each year by coal trucks that travel the Acord Lakes Road to and from the SUFCO mine.

In the Water Hollow Benches area, the G. L. Olsen Allotment is grazed from May 16 to June 30. The cattle are trailed from the early spring pasture to this allotment and then trailed to the summer Quitchupah Allotment.

The livestock movement within each allotment is currently controlled by fences, natural slope and terrain barriers, and the watering sources (i.e. Quitchupah Creek and Water Hollow drainage). Thus, livestock are generally confined to an area within one mile of the creeks during spring and fall grazing seasons. Livestock movements during trailing are generally controlled by the permittees who push the larger herds of cattle along the existing unpaved road adjacent to Quitchupah Creek and Convulsion Canyon. The trailing of livestock in the spring and fall is confined to the existing road and two-track because it is part of a traditional livestock trail, and because the terrain generally confines trailing to the existing road and immediate vicinity. The smaller herds and stragglers move on their own along the creeks until they reach their destination.

The boundary fence running north-south across the Convulsion Canyon bottom on the Fishlake National Forest border prevents livestock from entering the Quitchupah Allotment in the spring until the allotted turn-in date. In the fall, the gate is open to allow livestock to drift down the canyon and off the allotment. The lower fence runs north-south in the middle of Section 15 and along the west boundary of the patent land and the irrigated croplands. This fence is used to prevent livestock from entering the croplands until so desired. The lower fence is also used as a drift fence to hold livestock trailing down the canyon in the fall so they can be corralled and separated for transfer to winter ranges. In the spring, this fence also prevents livestock from drifting off of winter ranges onto spring range until the allotted turn-in date.

A drift fence is also located across lower Water Hollow to keep cattle from drifting down the stream and into Quitchupah Creek. A small corral is located adjacent to this drift fence to aid in the gathering of cattle.

**FISHLAKE NATIONAL FOREST**

The management prescription for the Forest lands in the Project Area emphasizes livestock grazing via intensive management level D for range resources. One allotment, the Quitchupah Allotment, provides the summer forage for livestock trailing out of Quitchupah Creek to Fishlake National Forest lands. Most of the summer pasture is located on Duncan and Little Duncan mountains, and the Skutumpah basin. The grazing season is from June 11 to September 30 annually for 813 cattle plus calves (4,042 AUMs). The cattle are owned by five permittees who live or have ranches near the mouth of Quitchupah Creek. Traditionally the ranchers take turns herding their cattle up the Quitchupah Creek drainage to the Convulsion Canyon trail so that mother cows and calves can stay together. It takes one to two weeks of trailing the cattle up the creek to arrive at the higher elevation summer pastures. Cattle take one to two weeks of trailing and drifting to come off the summer pastures in the fall. The off-date, September 30, is the date that cattle are supposed to be completely off the Forest. During the round up, cattle are gathered and herded to Broad Hollow and pushed down Convulsion Canyon to Quitchupah Creek. There will be several large gathers and cattle are headed down the canyon at different times. If cattle are stirred up or winter type weather arrives, cattle may head or drift down the canyon on their own. Cattle may be found drifting down the trail at any time during the grazing season. During trailing the cattle graze along the creek in Convulsion Canyon and along Quitchupah Creek.

**BLM PRICE FIELD OFFICE**

Four BLM allotments are located in the Quitchupah Creek watershed. The large Saleratus Allotment which includes the valley and benches south of Quitchupah Creek is used as winter range. The Johnson Allotment that includes the benches north of the creek is also used as winter range. The G. L. Olsen

Allotment on the Water Hollow Benches is a late spring - early summer allotment. The E. Olsen Allotment is used as spring range. These allotments provide 2,286 AUMs. See **Table 3.8-1** for specific information on each allotment. See **Figure 3-5** for allotment boundaries. Water sources in the allotments include Quitchupah Creek and the stream in Water Hollow.

**Table 3.8-1 Grazing Allotment Information**

| Allotment Name | Permittee | Season of Use (acres per AUM) | Head of Cattle | AUMs* |
|---|---|---|---|---|
| **BLM Allotment** | | | | |
| E. Olsen | Glendon E. Johnson (Castle Valley Ranch) | April 16-June 15 (22.1 acres) | 20 | 20 |
| Saleratus | L.D. Jensen | November 1- March 31 (12.5 acres) | 69 | 308 |
| | Josiah K. Eardley | | 108 | 483 |
| | George U. Lewis | | 28 | 126 |
| | Glendon E. Johnson | | 156 | 698 |
| | J.R. Lawrence | | 49 | 219 |
| G.L. Olsen | L.D, Jensen | May 16-June 30 (6.8 acres) | 165 | 250 |
| Johnson | John L. Byars | October 16-December 31 (30.6 acres) | 72 | 182 |
| **Forest Service Allotment** | | | | |
| Quitchupah | Castle Valley Ranches, LLC<br>Josiah K. Eardley<br>Gary Petty<br>Morgan Robertson<br>John Sundstrom<br>L.D. Jensen | June 11 – September 30 | 813 | 4,042 |

* An AUM is calculated as the forage needed to sustain one head of cattle for one month.

**STATE LANDS**

The State lands in Section 16 are used in the spring at the discretion of the permit holder (L.D. Jensen), as part of the Saleratus Allotment. Since the State lands are not fenced separately, they are managed in the same manner as the BLM allotment (Ron Torgeson, SITLA, personal communication 2005).

## Potential Impacts To Range

The Environmental Consequences of each Alternative, in regard to range, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

**REGULATORY**

These allotments are operated under the Utah State open range law, which requires those who wish to exclude livestock from their lands or facilities to fence the livestock out. Although Utah is a fence-out state, it is up to the counties to enforce it. Often ranchers depend on their insurance to cover their livestock losses due to vehicle collision. In order to exclude livestock and minimize the incidence of vehicle-livestock collision, the proposed roadway would be fenced, and a 1.5-mile cattle trail would be constructed along the north side of the westernmost portion of the road.

The construction and operation of the road would have no affect on the permits to graze in the respective allotments under provisions of the Federal Land Policy and Management Act.

The applicant committed measure to remove grazing in the riparian zone on public lands would consist of 4.7 miles of fencing of riparian area on BLM, FS, and State lands and would occur through terms and conditions of the Saleratus and E. Olsen allotment permits. As a result of this, there would be a total loss of five AUMs. Trailing permits and fencing would restrict livestock access to the riparian zones on National Forest, State, and public lands. Fenced access points at underpasses on Alternative C would allow livestock access to water in the stream, and access points to water would be located along the 4.7 miles of riparian fencing. Altogether approximately 4.7 miles of stream corridor would be protected from stream grazing.

**POTENTIAL IMPACTS**

**NO ACTION - ALTERNATIVE A**

The coal trucks would still use the Acord Lakes Road, I-70, and SR-10 to transport coal to the Hunter Power Plant and Banning loadout. The livestock grazing would continue in traditional ways with generally unrestricted access to most of the Quitchupah Creek area. Livestock trailing between summer and winter pastures would continue in the traditional manner along the creek corridor. Straggling livestock crossing the Acord Lakes Road at Broad Hollow would be at risk of truck-livestock collisions.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**

The temporary loss of forage would amount to a total of 8 AUMs in four allotments (Quitchupah, Saleratus, Johnson, and E. Olsen) based on the net disturbance of 92.3 acres due to road construction. Once reclamation was complete and the seeded vegetation has matured, the net loss would be 4 AUMs, due to 45 acres of paved roadbed.

This road alignment would cross 600 feet of cultivated pasture owned by Castle Valley Ranches. Approximately 1.4 acres of pasture, out of approximately 145 acres, would be lost for livestock (and wildlife) winter forage. The construction of the road would require relocating the corrals and portions of the lower drift fence.

Riparian fencing would preclude livestock from in-stream watering along 4.7 miles of Quitchupah Creek on public lands. Livestock would have access to the streams for watering purposes at fenced sites, so livestock grazing along the proposed road would be restricted from accessing the stream corridor except at these fenced points.

The construction and operation of a heavily traveled road over and adjacent to the traditional livestock trail would render most of the trail unusable by cattle. A designated livestock trail along 1.5 miles of the western segment of the road would provide a trailing corridor in the terrain restricted portions of the canyon. Along the remaining portion of the trailing route, livestock would simply trail outside of the fenced road corridor. Holding facilities near Broad Hollow, in Convulsion Canyon, and Quitchupah Creek would keep stragglers off the proposed road. The holding facilities would disturb about one acre total at two sites. Short drift fences in Broad Hollow would guide cattle through a culvert under the Acord Lakes Road; thus, negating the potential for collisions with coal trucks.

**ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN - ALTERNATIVE C**

The Alternate Junction with SR-10 would disturb slightly more land (96.3 acres), but temporarily affect an equivalent amount of AUMs (8), as described for Alternative B, in the four allotments. Once reclamation were complete, the net loss would be 4 AUMs, due to 45 acres of roadbed.

The Alternative design to provide underpasses for wildlife/livestock would significantly reduce the potential for vehicle-wildlife/livestock collisions. The fencing and underpasses would allow livestock to graze freely in the allotments and have access to Quitchupah Creek except for where the cattle would be confined to the cattle trail. The fencing, in a few places, could restrict livestock use of forage located between the proposed road and the plateaus to the north. Riparian fencing would preclude livestock from in-stream watering along 4.7 miles of Quitchupah Creek. Livestock would have access to the streams for watering purposes at fenced sites along that 4.7 miles.

The road alignment across the E. Olsen Allotment would bisect the allotment creating two pastures by blocking access north and south for livestock. An underpass on the west end would alleviate the blocking in that area but not further east, unless the large culverts would serve as underpasses for livestock.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

The initial temporary loss of forage would amount to 12 AUMs based on the total disturbance of 146.3 acres due to road construction; approximately 4.5 AUMs (1.8 percent of total allotment) in the G. L. Olsen Allotment and 7.5 AUMs (0.4 percent of total allotment) in the Saleratus Allotment on Water Hollow Bench. Once reclamation is complete and the seeded vegetation has matured, the net loss would be 5 AUMs (less than 1 percent losses of total allotments) due to an unreclaimed area of 55 acres of paved road. Much of the proposed route through the Saleratus Allotment is in rugged terrain where there is little use of forage by cattle, although in the flats adjacent to SR-10 there is considerable grazing in the winter.

Cattle in the G. L. Olsen Allotment water in Water Hollow drainage and trail in and out daily to graze on the benches above the creek. The large fill for the proposed road crossing and fencing would block livestock access to Water Hollow drainage so a water distribution system would be installed and operated during the grazing season.

Fencing the road throughout the G.L. Olsen Allotment would divide the allotment into a two-pasture system. The rotation of grazing between the pastures and the placement of watering troughs in the pastures would promote better distribution of cattle and proper use of the forage. Currently, the seedings are heavily used on the west end because the only source of water is located in that area. With the water distribution system there would be four troughs, two in each pasture, so cattle could potentially graze the seedings (See **Section 3.5** Wildlife) located in the east and northeast portions of the allotment.

Since the seedings within the G.L. Olsen Allotment would be enhanced and expanded to provide forage for wintering big game, additional forage would be produced that would also benefit cattle. The use of forage by cattle would need to be managed to allow sufficient forage to remain for big game use in critical snow years. The forage provided by the seedings would offset the AUMs lost by road construction.

The fencing of the proposed road on the flats in the Saleratus Allotment would keep cattle off the roadway. When cattle need to be moved within the allotment, this would be on a coordinated schedule with the SUFCO Mine.

Movement of livestock would occur as it would under Alternatives B and C using a constructed cattle trail, fencing, and holding facilities.

Riparian fencing would preclude livestock from in-stream watering along 4.7 miles of Quitchupah Creek. Livestock would have access to the streams for watering purposes at fenced sites.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

The construction of livestock trail, road fencing, and underpasses along the roadway would mitigate impacts to livestock. Palatable species would be seeded along the underpasses to entice livestock to utilize the underpasses to cross the roadway. A noxious weed control plan would be developed in cooperation with the land management agencies prior to construction and then implemented as necessary.

Monitoring for a minimum of three years, as discussed in the Mitigation and Monitoring Plan, would ensure the stability and operation of the trail, fences, underpasses, seedings, water distribution systems, and reclamation in the Project Area.

The loss of livestock due to vehicle-livestock collisions will likely continue in the future, even with the livestock trail and fencing. Ranchers are compensated for livestock loss through the open-range law, but often depend on insurance to cover livestock losses since collisions are not always reported.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

Unreclaimed disturbance from construction and operation of the public road would mean irreversible losses of range forage as follows: Alternative A - 0 AUMs, Alternative B - 4 AUMs, Alternative C - 4 AUMs, and Alternative D - 5 AUMs. Under all build alternatives, an additional 5 AUMs would be lost due to agency commitment not to allow grazing in the riparian zone along 4.7 miles of public lands. For Alternative D the additional forage developed in the seedings for big game would compensate for loss of AUMs in the G.L. Olsen Allotment.

**CUMULATIVE EFFECTS**

Past livestock improvements, including the development of a reservoir on Saleratus Bench, have increased water distribution for livestock. The loss of livestock due to vehicle-livestock collisions has been on-going through the past and present, and will likely continue in the future. Ranchers would be compensated for livestock loss through the open-range law; therefore, it is not an undue impact on the rancher. Future vehicle-livestock collisions along the proposed road would be minimized by a designated livestock trail and fencing of the road corridor.

There are eight authorized federal oil and gas leases in the Project Area (see **Section 3.9** Land Use). Gas and oil exploration and drilling could occur and may affect allotment forage. Reclamation would occur on sites that do not enter into production.

The removal of livestock grazing from 4.7 miles of stream corridor would allow those sections of Quitchupah Creek to stabilize over time, thus reducing their current contributions to sediment and salt loading. Livestock would not be able to graze on reclaimed areas until the agencies have accepted reclamation and revegetation as successful.

The proposed fencing and underpasses would control movement of livestock along SR-10 and Acord Lakes Road.

# 3.9 Land Use

**HISTORICAL BACKGROUND**

Quitchupah Creek, described as a long narrow valley of sagebrush and greasewood, coyotes and prairie dogs, was opened for homesteading in the 1880s. Within a few years several ranches were established, growing alfalfa, wheat, oats, and barley in the fields, and raising sheep and cattle. Goods were traded in nearby Emery town. A terrible storm in 1912 drastically changed the nature of the valley, and the placid Quitchupah Creek was transformed into a deeply gouged wash with many deep gullies. Over time, although the settlers attempted to utilize a dam and canals, the fields were drained by the wash, and the families began to leave Quitchupah Creek (Historical Committee of Emery, 1981). Other ranchers purchased lands both north and south of the creek. The nearby community of Emery was incorporated as a town in 1901.

**LAND STATUS**

The lands that would be crossed by the proposed road include private, public, and SITLA, as shown on **Figures 2-1, 2-2,** and **2-10**. Public lands include those managed by the USFS, Fishlake National Forest and the BLM, Richfield Field Office.

Private landowners along the existing Quitchupah Creek Road include: Castle Valley Ranches LLC, Thomas C. Bunn, et al., James V. Olsen, Julian Bowman, George E. and Patricia L. Olsen, and Wynona P. Olsen. Private landowners along the proposed Alternate Junction with SR-10 include: Castle Valley Ranches, LLC; and Kenneth Lee & Earlene F. Christiansen. Private landowners in the area that would be crossed by the Water Hollow Alternative include Castle Valley Ranches, LLC. These landowners do not currently reside on those lands, but typically use them in conjunction with their livestock operations.

**Table 3.9-1** provides a summary of land status and an estimate of new surface disturbance for the proposed Quitchupah Creek Road (Alternative B). **Tables 3.9-2** and **3.9-3**, that follow, provide similar summaries for the Alternate Junction and Alternate Design Alternative (Alternative C), and the Water Hollow Alternate Alignment (Alternative D).

**Table 3.9-1 Land Status and Proposed Disturbance - Alternative B**

| Land Mgmt. | QCR Road Distance (miles) | County Jurisdiction | Road Construction Disturbance (acres) | Existing Road Disturbance (acres) | Staging Areas (acres) | Pull-Outs (acres) | Total New Surface Disturbance (acres) |
|---|---|---|---|---|---|---|---|
| USFS | 2.3 | Sevier | 24.0 | 3.3 | 5.0 | 0.3 | 26 |
| BLM | 1.8 | Sevier | 18.4 | 1.8 | 5.0 | 0.3 | 21.9 |
| SITLA | 1.1 | Sevier | 12.3 | 0.9 | 5.0 | 0 | 16.4 |
| Private | 3.7 | Sevier & Emery | 33.7 | 5.7 | 0 | 0 | 28.0 |
| Totals | 8.9 | | 88.4 | 11.7 | 15.0 | 0.6 | 92.3 |

**Table 3.9-2 Land Status and Proposed Disturbance - Alternative C**

| Land Mgmt. | Road Distance (miles) | County Jurisdiction | Construction Disturbance (acres) | Existing Road Disturbance (acres) | Staging Areas (acres) | Pull-Outs (acres) | Total New Surface Disturbance (acres) |
|---|---|---|---|---|---|---|---|
| USFS | 2.3 | Sevier | 24.0 | 3.3 | 5.0 | 0.3 | 26.0 |
| BLM | 2.8 | Sevier | 23.6 | 1.4 | 5.0 | 0.3 | 27.5 |
| SITLA | 1.1 | Sevier | 12.3 | 0.9 | 5.0 | 0 | 16.4 |
| Private | 2.9 | Sevier & Emery | 31.4 | 5.0 | 0 | 0 | 26.4 |
| Totals | 9.1 | | 91.3 | 10.6 | 15.0 | 0.6 | 96.3 |

**Table 3.9-3 Land Status and Proposed Disturbance - Alternative D**

| Land Mgmt | Road Distance (miles) | County Jurisdiction | Construction Disturbance (acres) | Existing Road Disturbance (acres) | Staging Areas (acres) | Pull-Outs (acres) | Total New Surface Disturbance (acres) |
|---|---|---|---|---|---|---|---|
| USFS | 2.52 | Sevier | 30.5 | 2.6 | 5.0 | 0.3 | 33.2 |
| BLM | 7.94 | Sevier | 95.3 | 0 | 10.0 | 0.6 | 105.9 |
| SITLA | 0.26 | Sevier | 2.4 | 0 | 0 | 0 | 2.4 |
| Private | 0.53 | Sevier | 4.8 | 0 | 0 | 0 | 4.8 |
| Totals | 11.25 | | 133.0 | 2.6 | 15.0 | 0.9 | 146.3 |

**Land Use And Land Use Plans**

Historical and ongoing land uses and rights in the Project Area include homesteading, livestock trailing and grazing, wildlife migration and wintering, mining, instream livestock watering rights, irrigation water rights, cultivated pasture, agriculture, and recreation.

The management of public lands within the Project Area is guided and directed by the San Rafael RMP (USDI-BLM, 1991), FPU MFP (BLM, 1982), and the Fishlake National Forest LRMP (USDA-USFS, 1986).

Although the Richfield Field Office is ultimately responsible for management of the BLM-administered lands in the Project Area, management guidance comes from the BLM Forest Planning Unit MFP (BLM, 1982) and San Rafael RMP (USDI-BLM, 1991) produced and implemented by the BLM's Price Field Office. The Richfield Field Office is currently updating the RMP and it is scheduled to be completed in the spring of 2006.

Management of the SITLA lands in the Project Area is directed by the Richfield Office of SITLA.

Land management decisions on private lands in Sevier and Emery Counties are guided by county land use plans, and zoning ordinances and regulations. As described in the Emery County General Plan, Emery County is committed to preservation of a rural lifestyle, and citizens place great value upon open space, history, and preservation of their heritage. Maintaining access to, and use of, public lands within the county is also a commitment of the plan. The Sevier County General Plan (Sevier County, 1998) similarly expresses a desire to maintain access to public lands in their county, and to encourage multiple uses within those lands.

**Zoning**
The Emery County lands in the Project Area are zoned M&G-1, Mining and Grazing. This zone generally covers the dry mountain and desert areas of the county historically used for grazing on the open range, and mining and mineral exploration. The characteristics and conditions on these lands make them suited for a continuation of these uses. However, because of the relatively fragile balance of nature in the area, all permitted activities must be carried out in a manner consistent with the limitations of the environment (Zoning Ordinance for Emery County, 1999).

The Sevier County lands in the Project Area are zoned GRF-40, Grazing, Recreation, and Forestry. As described in the Sevier County Code (Sevier County, 1995), this zone has been established as a district in which the primary use of the land is for grazing, recreational, forestry, and wildlife purposes. Density requirements of structures within this zone are one unit per 40 acres. The code does not mention roads as a land use that is either automatically or conditionally permitted in this zone.

**Access**
The Quitchupah Creek area is accessed either from the east at SR-10, or from the west off the paved Acord Lakes Road, which is used as coal transport road by the SUFCO Mine. The Water Hollow Benches area is accessed off of the existing Quitchupah Creek Road, or off of a jeep trail leaving SR-10 south of the Quitchupah Creek Road. However, vehicle access to the Water Hollow Benches is possible only with ATVs, and then only in some areas. The existing road along Quitchupah Creek is unpaved and prone to washouts and rutting as a result of storm events. Along portions of the road, it is unmaintained and occasionally impassable.

**Structures and Utilities**
The most noticeable man-made structure along Quitchupah Creek is the UP&L Company power line, a 9.6-mile long 69 kV tap line for SUFCO, completed about 1977. It provides power to the SUFCO Mine. The right-of-way for this power line is 25 feet, or 12.5 feet on either side of its centerline. Three other major power transmission lines cross the eastern part of the Project Area.

Other existing structures within the Quitchupah Creek Road corridor, related to agricultural/livestock uses, include irrigation canals, corrals, livestock fences, and a baling yard. A metal water pump house building and a septic leach field, both related to the SUFCO Mine are adjacent to the Quitchupah Creek Road corridor. Water lines between the spring collection area and the pumphouse and between the pumphouse and the SUFCO Mine pass under the roadway. There are no structures near the Water Hollow alternate alignment (Alternative D).

A telephone line has been installed underground along the Quitchupah Creek Road from the east to the Emery County line, and then strung from the existing UP&L poles up to the SUFCO Mine.

**Minerals – Oil & Gas**
Texaco had an oil, gas, and hydrocarbon lease on the State land Section 16 - ML#47105. This lease was to expire in 2005 but was cancelled for non-payment on January 2, 2004. According to SITLA, no work was ever conducted under this lease (Bonner, personal communication 2005). SITLA included this section in the January 6, 2005 Competitive Lease Offering for Oil, Gas, Hydrocarbon, and other Mineral Commodities and it is currently under lease (**Table 3.9-4**).

There are several oil and gas leases held on public lands in the area, as noted in the following table.

**Table 3.9-4 Oil & Gas Leases**

| Agency | Lease # | Leasee | Location | Township, Range |
|---|---|---|---|---|
| BLM | UTU - 075067 | Texaco | Section 17,18 | T22S, R6E |
| BLM | UTU - 075062 | Texaco | Section 13,14,15 | T22S, R5E |
| BLM | UTU -074819 | Texaco | Section 17,20,21,22 | T22S, R5E |
| BLM | UTU - 072583 | Texaco | Section 27,28,33,34 | T22S, R5E |
| BLM | UTU- 075224 | Texaco | Section 25,26,34,35 | T22S, R5E |
| BLM | UTU - 075063 | Texaco | Section 1, 12,14 | T23S, R5E |
| BLM | UTU - 072753 | Texaco | Section 3,4,5,8,9,10 | T23S, R5E |
| BLM | UTU - 073214 | Texaco | Section 2 | T23S, R5E |
| SITLA | ML 49664 | Greg Klurfeld | Section 16 | T22S, R5E |

## Potential Impacts To Land Use

The Environmental Consequences of each Alternative, in regard to land use, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

### REGULATORY

Existing permitted uses on the lands in the Project Area, such as grazing and water rights, would continue. In Emery County, permitted activities must be carried out in a manner consistent with the limitations of the environment (Zoning Ordinance for Emery County, 1999). In Sevier County the primary uses must be preserved.

The proposed project is in compliance with the San Rafael RMP and FUP MFP for the public lands and the Fishlake National Forest Land and RMP for Forest lands (See Section 1.3). Currently, the planning process for the Dixie and Fishlake National Forests Forest Plan Revision is ongoing and has included several public meetings and workshops. The Draft Management Direction Package for the Fishlake National Forest was released April 28, 2005. The projected date for plan decision is winter 2006/2007.

### POTENTIAL IMPACTS

#### NO ACTION - ALTERNATIVE A

There would be no effects to land use along the existing two-track road along Quitchupah Creek or along the Water Hollow Benches. Current land uses would continue.

#### QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B

Under this Alternative, it is estimated that new disturbance would affect 26.0 acres of USFS land, 21.9 acres of BLM land, 16.4 acres of State land, and 28 acres of private land, for a total of 92.3 acres. The requested rights-of-way for the permanent road corridor would include 18.4 acres of USFS lands, 15.2 acres of BLM lands, 8.8 acres on State lands, and 31.2 acres private lands. The FS would issue a Public Road Easement and the BLM would issue a right-of-way grant. Right-of-way applications have been submitted to the USFS and BLM. The right-of-way for the existing road consists of prescriptive easements. Rights-of-way across seven private land parcels (six landowners) are dependent upon individual negotiations.

In addition, an encroachment permit would have to be obtained from UDOT in order to construct the junction with SR-10. The disturbance for construction of the intersections and additional lanes would occur within the UDOT right-of-way or acquired right-of-way.

Fences and corrals would be removed from the road corridor during right-of-way preparations, and the necessary replacements or repairs made as agreed upon. Similarly, the baling yard would be modified or relocated to an agreed upon area.

The irrigation canal currently supplying the agricultural fields south of the road would be impinged upon by the new road footprint in several locations, necessitating realignment or culverting of about 0.5 mile of total canal length. This would affect the canal/pipe in the following locations: near station 290+00, from stations 302+00 to 308+50, from stations 321+00 to 324+00, and from stations 333+00 to 350+00 (see **Appendix B**, Engineering Details). Approximately 1.4 acres (out of 145 acres – less than 1 percent) of prime farmland soils would be impacted as the road crosses over the corner of the agricultural fields.

Preliminary design indicates that a power pole adjacent to station 166+30 may need to be relocated. All power pole relocations would be performed by the owning power company (UP&L) and would be relocated to suitable locations as determined by UP&L. The relocations would be within either the road or power line rights-of-way.

The Emery County telephone line, buried along the road east of the County line, may be affected by grading and right-of-way preparation. The same line would be affected by the above power pole relocation. This would require the telephone company to repair or replace any of the damaged cable.

Mineral or fuel exploration and development efforts in the State lands section could be furthered by the presence of a paved road; however, no plans for exploration are currently proposed.

### ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C

This alterative includes the same road corridor as Alternative B, except for the easternmost two miles. Under this Alternative, it is estimated that new disturbance would affect 26.0 acres of USFS land, 27.5 acres of BLM land, 16.4 acres of State land, and 26.4 acres of private land for a total of 96.3 acres. Rights-of-way across two private land parcels are dependent upon individual negotiations. After reclamation, 46 acres would be dedicated to the road right-of-way.

In addition, an encroachment permit would have to be obtained from UDOT in order to construct the junction with SR-10. The disturbance for construction of the intersections and additional lanes would occur within the UDOT right-of-way or acquired right-of-way.

Other impacts would be the same as described for Alternative B, except that the planned buried telephone line would not be affected. Further, the safe movement of wildlife and livestock across the road would be facilitated by fencing and under passes.

### WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D

Except for the westernmost two miles of road, where this Alternative shares the same alignment as Alternatives B and C, lands along Quitchupah Creek would not be affected by the Water Hollow alignment. Total new disturbance would affect 33.2 acres of USFS land, 105.9 acres of BLM land, 2.4 acres of State land, and 4.8 acres of private land for a total of 146.3 acres. Right-of-way across one private land parcel is dependent upon individual negotiations.

In addition, an encroachment permit would have to be obtained from UDOT in order to construct the junction with SR-10. The disturbance for construction of the intersections and additional lanes would occur within the UDOT right-of-way or acquired right-of-way. After reclamation, a total of 55 acres would be dedicated to road right-of-way.

An outside source for borrow materials would likely be required under this Alternative, borrow materials would be excavated from private lands off-site, in an area where such use is allowed.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**
All new roads across Federal, State, or local lands would be constructed to or exceeding applicable standards. The road drainage system and reclamation of disturbed lands would be monitored for a minimum of three years, and require achieving certain goals prior to release (see Monitoring Plan).

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**
Due to the proposed road being a public road under the jurisdiction of Sevier County SSD, the road would remain in service as a rural collector road in the State road system after the mine has ceased transporting coal, and be an irreversible use of the land committed to a right-of-way.

Loss of private ownership of the right-of-way would be an irretrievable and residual impact to the private landowners. In addition, fragmentation of private property would be an irretrievable impact.

**CUMULATIVE EFFECTS**
Past and present land uses include mining, grazing, agriculture, utilities and road rights-of-way, and recreation. The proposed project would dedicate an additional 45-55 acres of land to roadway. There are eight authorized federal oil and gas leases in the Project Area. SITLA has leased Section 16 in the Project Area for the exploration and development of coal-bed methane gas resources. The proposed road on public lands would traverse Section 16 and would provide improved access for future exploration and development. Potential gas reserves on public lands would also be accessible. Future land use changes such as gas field development would be compatible with and supported by road development.

## 3.10 Visual Resources, Recreation, and Wilderness

### 3.10.1 Visual Resources

Visual resources are a composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify an area and influence the visual appeal that the area may have to people (Forest Plan). The scenic quality of the Project Area is influenced by the canyons which dissect the Wasatch Plateau, and various geologic formations providing a range of textures and colors evident in escarpments, canyon walls, and badlands. The horizontally bedded nature of these formations, as well as their component range of texture classes, is evident from the steep canyon walls, escarpments, and badlands visible in the Project Area. Flat ledges, vertical cliffs, and sloping erosional and depositional surfaces all contribute to the varied relief in the Project Area. The presence of the meandering Quitchupah Creek, its flood plain, and its terrace features also contribute to the visual diversity of the lower elevations of the Project Area.

The nature of vegetation in the landscape is consistently low and shrubby in the bottomlands, and blankets the valleys with a consistent cover, contrasting with the dotted juniper on reddish-brown eroding slopes. White to grey slopes present in some parts of the Project Area have less evident, sparse vegetative

cover. Water courses are generally accented with willows, tamarisk, and cottonwood trees; along lower Quitchupah Creek, portions of the flood plain lack noticeable vegetation, but have extensive areas of bright white alkali deposits that provide for visual variation. The upper Quitchupah drainage transitions from the pinyon-juniper slopes to oak scrub and conifers, with aspen and dense willow patches in the narrow drainage bottom. The contrast of agricultural fields is another feature present in parts of the Project Area. Facilities in the viewshed include roads (SR-10 and Quitchupah Road), fences, power lines, transmission lines, corrals, mine structures, and fairly constant coal truck traffic. The landscape within and surrounding the Project Area, as well as the remote and peaceful nature of the Quitchupah and Water Hollow areas, and historical/cultural ties to the area contribute to the people's sense of important aesthetic values in this area.

The objective of Visual Resource Management (VRM) for BLM lands in the San Rafael Resource Area is "to provide design standards that protect or enhance designated VRM classes" (USDI-BLM, 1991). Visual Resource Management Classes I-IV are described as follows:

| | |
|---|---|
| Class I | Preserve existing character of landscape; very limited management activity; low levels of change to the characteristic landscape. |
| Class II | Retain existing character of landscape; management activities should not attract attention; changes must blend with the natural landscape. |
| Class III | Partially retain existing character of landscape; moderate level of change allowed; management activities should not dominate the view; changes should blend with the natural landscape. |
| Class IV | Provision for management activities which require major modification of existing character of landscape; high level of change allowed; activities may dominate the view. |

The areas of BLM public lands in the Quitchupah Creek area within Sevier County are classified as VRM Class IV. This classification provides for management activities which require major modification of the existing character of the landscape. In Emery County, the BLM portion of Section 19, Township 22 South, Range 6 East, is designated as VRM Class III. The closest VRM Class II area is near the junction of SR-10 and I-70. The I-70 scenic corridor to the east of SR-10 in Emery County is designated as Class I.

National Forest lands are typically inventoried based upon a system of Visual Quality Objectives (VQOs) as part of the forest unit planning process. The VQOs are categories of acceptable landscape alteration measured in degrees of deviation from the natural landscape (Forest Plan). They are similar in concept to the BLM classes of management, and are described as follows:

| | |
|---|---|
| Preservation (P) | Ecological change only. |
| Retention (R) | Human activities should not be evident to the casual Forest visitor. |
| Partial Retention(PR) | Human activities may be evident but must remain subordinate to the characteristic landscape. |
| Modification (M) | Human activity may dominate the characteristic landscape, but at the same time must utilize naturally occurring elements of the landscape including form, line color, and texture. |
| Maximum Modification (MM) | Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as a background. |

Forest lands in the Project Area have been designated under the VQO system as Modification.

**Key Observation Points**
Key Observation Points (KOP) were established as the predominant points from which viewers would be most likely to observe changes imposed by the proposed project. Three KOPs involve views from SR-10 towards the Project Area (See **Figure 3-5**). One KOP (#1) was established at the point where Quitchupah Creek Road meets SR-10; the second KOP (#2) was taken from the point where the proposed Water Hollow route would join SR-10. The third KOP (#3) was established at the Alternate Junction with SR-10. Although these would not be designated view areas, traffic turning onto the proposed Quitchupah Creek road, Water Hollow road, or Alternate Junction from SR-10 would be forced to slow considerably, and most likely provide an opportunity for viewing the project changes (see **Figure 3-5**).

Two KOPs were also established within the Project Area at the junction of the Alternative Junction and Quitchupah Creek Road (#4) and along the proposed Water Hollow Route (#5).

## Potential Impacts To Visual Resources

The Environmental Consequences of each Alternative, in regard to visual resources, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

**REGULATORY**
The project would have no regulatory implications for visual resources. There would be no effects on visual classifications, a regulated land use planning criteria.

**POTENTIAL IMPACTS TO VISUAL RESOURCES**
**NO ACTION - ALTERNATIVE A**
There would be no effects to existing visual and aesthetic qualities of the Project Area. Views from SR-10 would remain as they currently exist, including the steady stream of coal trucks along SR-10 during hours of SUFCO Mine operation.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**
The proposed Quitchupah Creek road itself would be visible in the immediate foreground as a paved lane entering SR-10, but would not be obvious unless viewed from the hill on SR-10 to the northeast, or passing directly across the intersection while traveling on SR-10. The dominant terrain at the intersection is stream terraces supporting tall brush. The haul truck traffic (trucks every 1.5 to 3 minutes) through lower Quitchupah Creek may be visible for a few minutes in the background south of the intersection by northbound travelers on SR-10. The background view is dominated by shrub-covered flats, low hills, and small mesas. Road cut and fill disturbance from construction would be visible in the immediate foreground from within the canyon, however, these contrasts would fade somewhat over time, with soil/rock weathering, and reclamation.

The project does meet the standards for BLM's VRM Class IV and the USFS's VQO activity of Modification. None of the visual classifications would need to be changed to accommodate the project.

The aesthetic qualities of the canyon, including its peaceful and remote nature, would be altered forever. However, the degree to which individuals are affected by the intrusion of a paved road and associated coal truck traffic would be personal and may vary depending upon reasons for using the canyon, as well as personal ties to the history of the area.

The new junction with SR-10 would require additional lanes for turning and acceleration at an existing intersection from the east with the CONSOL Mine Road. These changes would not affect the existing visual and aesthetic qualities of the Project Area.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**

Visual and aesthetic implications of Alternative C would be similar to those of the Alternative B in the majority of the canyon. Additional structures in the form of concrete underpasses would be visible to travelers on the road, however they would not dominate the view. Between the Sevier County/Emery County line and the junction with SR-10, this route crosses low shrub-covered gentle slopes adjacent to SR-10 and dissected tree-covered slopes on the western portion. The existing character of the landscape would be partially retained in this area.

A new junction with SR-10 would be required for this Alternative with additional lanes for turning and acceleration along SR-10. These changes would not effect the existing recreation, visual and aesthetic qualities of the Project Area.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

Views from KOP #1 at the Quitchupah Creek Road junction with SR-10 would remain unaffected by this Alternative. From KOP #2, the road would be obvious mainly in the foreground of low shrub-covered valley slopes. The road would essentially disappear into the hills and bluffs to the west as it crosses behind some low tree-covered rugged hills less than one mile from SR-10.

Within the Water Hollow Benches, the visual changes would be dramatic, with the large cut and fill volumes needed to cross the many deep drainage cuts across these benches. The changes due to large cut and fills would be within management activities criteria for VRM Class IV (**Figure 3-5**). The scenery within the Project Area consists of large mesas, wide benches, and deep dissected slopes. Views from the road on the Benches would be panoramic scenes of the valley below and mountains in the distance.

A new junction with SR-10 would be required for this Alternative with additional lanes for turning and acceleration along SR-10. These changes would not effect the existing visual and aesthetic qualities of the Project Area.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

Careful consideration has been given to the siting of the proposed alignments to reduce adverse visual impacts to the maximum extent possible. The reclamation of disturbed areas along with monitoring to ensure successful reclamation and to prevent erosion would over time allow the bare areas to revegetate and emulate the native plant communities. No further mitigation or monitoring activities are described for the Proposed Action or Alternatives.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

The aesthetic qualities of Quitchupah Creek would be altered forever. Residual adverse impacts would be the presence, form, and line of a paved road in the Quitchupah drainage or Water Hollow Benches.

**CUMULATIVE EFFECTS**

The Proposed Action, in conjunction with past, present, and reasonably foreseeable future actions would result in additional surface disturbance. Surface disturbance in the past has resulted from the development of the old two-track road, mining facilities, and power transmission lines. Once the reclamation has occurred, a large portion of the new surface disturbance would not be noticeable to the casual observer. Exploration for gas may require additional roads and disturbance. The proposed road would contribute a cumulative impact to visual resources.

## 3.10.2 Recreation

The majority of the Project Area is located within Sevier County with a small portion located in Emery County. The project proposes to upgrade the existing USFS Road 006 that is classified as an unimproved road (Class 4). A Class 4 road is defined by the USFS as a native surface, unimproved, jeep trail-high clearance road (Reed, 1999). The BLM portion of the road is identified as BLM Road #908.

The dominant recreation activities within the Project Area are hunting in the fall and ATV use year-round as conditions permit. The Project Area lies within the Manti Management Unit for elk and deer. In 1999, the large Manti Management Unit as a whole, reported about 16,500 deer hunters afield, with a 32 percent success rate, and almost 11,000 elk hunters with a 23 percent success rate, according to UDWR (2001). The Project Area has much less hunting effort than most of the Manti Unit. Local guides provide guided hunting trips in the Project Area for deer, elk, and mountain lion. Upland game is also hunted. Trapping for bobcat and coyote also occurs in the Project Area.

ATV use occurs both by individual local riders, and by organized clubs who gather regularly to ride in the area. One of those groups, the Southeastern Utah Off-Highway Vehicle (SEUOHV) Club has proposed that a series of two-track dirt roads across southeastern Utah be placed within a single system called the Castle Valley Trail System (Peterson, 1999). Included in the proposed Castle Valley Trail System is USFS Road 006, the existing dirt road within Quitchupah Creek canyon. The proposed trail system has been submitted to both the USFS and the BLM for approval. The SEUOHV Club currently has approximately 160 members which use the existing Quitchupah Creek road seasonally between April 15 and November 15. This two-track road is important to ATV users because it is one of the few ways that USFS land is accessed by ATVs from communities in Emery County (Peterson, 1999). Portions of the Water Hollow Benches and the flats to the east are accessible to ATVs; other portions are too rugged and dissected for vehicle use. The BLM has not designated vehicle routes. There are seasonal restrictions on vehicle use on some of the public lands for wildlife concerns.

BLM regulations, at 43 CFR 8340, outline the requirements for managing off-highway vehicles (OHVs) on public lands. The 1991 San Rafael RMP directed the Price Field Office to designate routes within the "limited to designated roads and trails" category through a public process. The route designations apply only to public lands, and are not applicable on state lands and private land inholdings. Other roads that have existing rights-of-way (ROW) will retain the restrictions or stipulations provided in the ROW.

In February of 2003 the BLM established the San Rafael Route Designation Plan which includes part of the proposed Project Area. The Plan provides a comprehensive system of open OHV routes with the BLM and County Class B road systems to provide more than 2,000 miles of roads and trails for recreation. The proposed Project Area is enveloped by the OHV categories “Open Areas” and “Limited to Designated Routes”. The Quitchupah Creek Road is currently designated a “Road - Not subject to Recreational Designations”. Also, part of the proposed Project Area is within designated Seasonal Limitations for Deer and Elk range. Travel is limited in these Seasonal Limitations for Deer and Elk areas between December 1 and April 15 of each year.

The BLM Travel Plan, due out in 2006 after the release of the final RMP, will designate a system of trails for OHVs, including ATVs. The Richfield RMP will designate areas where proposed uses, such as OHV sites, are acceptable on BLM land.

The Fishlake National Forest OHV Designation Plan is scheduled to be implemented in the summer of 2006. This Plan will designate roads, trails, and open areas for the use of OHVs. The rules and designations in the Plan will close the Forest to off-route motorized cross-country travel by OHVs except in designated areas. This Plan will improve management and enforcement of OHV use on Forest land.

Less dominant recreational uses in the general vicinity include dispersed camping, hiking, mountain bike riding, horseback riding, and sightseeing. There are no designated camp grounds or specific destination sites within the Project Area. Roads within the Quitchupah Creek Road Project Area are primarily four-wheel drive roads.

The public land in the Project Area has been classed by Recreational Opportunity Spectrum (ROS) Classes. According to the Fishlake National Forest LRMP, the majority of the USFS-administered lands in the Project Area are designated as having a semi-primitive motorized recreational opportunity (USDA-USFS, 1986). According to the San Rafael RMP (USDI-BLM, 1991), the BLM-managed lands along the existing two-track Quitchupah Creek Road are classed as Roaded Natural (about equal opportunities for affiliation with other use groups and for isolation from sights and sounds of man), and the Water Hollow Benches area is within Roaded Natural and Semi-primitive Motorized (some opportunity for isolation from the sights and sounds of man) ROS categories.

The Acord Lakes recreational area located to the west of the Project Area has approximately 100 seasonal homes.

The USFS has conducted various Roadless Area Review and Evaluations (RARE) on Forest lands. The nearest designated RARE are areas located 2.5 to 3 miles north and northwest of the Project Area, in the Manti-La Sal and Fishlake National Forests.

## Potential Impacts To Recreation

### REGULATORY

Increased access would likely increase use and may increase unauthorized use of areas restricted from motorized use. RMP ROS classes may require revision; these adjustments may be included in the updated RMP due to be released in 2006.

#### NO ACTION - ALTERNATIVE A

The dispersed recreation use would continue in this area.

#### QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B

Implementation of the proposed project would improve access to the area for big and upland game hunters and other recreationists. Allocated harvest numbers set forth by UDWR for the Manti Management Unit would remain unaffected by the proposed Quitchupah Creek Road project, but the number of hunters in the area could increase. Local guided hunting trips in the area would likely decrease with easier access to the area, while poaching opportunities from the paved road could potentially increase. However, construction activity and increased traffic can negatively impact wildlife and, if so, hunting opportunities may decline if wildlife numbers decrease due to collisions with vehicles or avoidance of the area.

Other recreationists, including campers, hikers, and sightseers would also have improved access to public land due to the proposed road, however, the quality of these dispersed recreation activities may be reduced due to noise from construction or traffic, or if wildlife avoids the area. The greater access from the east that the road would afford to the Acord Lakes recreational areas could be an economic benefit to Sevier County.

During weekdays coal trucks would be traveling on the road at 1.5 - 3.0 minute intervals depending upon the volume of coal transported to eastern markets and power plants. This concentration of traffic would influence any recreational uses adjacent to or on the road. During most weekends the road would be free of coal trucks. Dispersed recreation use in an isolated setting would no longer be available in Quitchupah Creek.

Under this alternative, the new paved Quitchupah Creek road from Highway 10 to the coal mine would be open to licensed, street-legal vehicles only. This would affect the proposed SEUOHV Castle Valley Trail system, since OHV access would be eliminated on the new paved road. The potential opportunity for designated OHV routes in the Water Hollow Benches area would remain. There would be no impact to the San Rafael Route Designation Plan.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**

Under this alternative, the new paved Quitchupah Creek road from Highway 10 to the coal mine would be open to licensed, street-legal vehicles only. This would affect the proposed SEUOHV Castle Valley Trail system, since OHV access would be eliminated on the new paved road. The potential opportunity for designated OHV routes in the Water Hollow Benches area would remain. There would be no impact to the San Rafael Route Designation Plan.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

Under this alternative, the new paved Quitchupah Creek road from Highway 10 to the coal mine would be open to licensed, street-legal vehicles only. The existing Quitchupah Creek road from Highway 10 to the National Forest boundary would remain accessible to the public, but only from the eastern end at the Highway 10 entrance. Motorized access from the existing Quitchupah Creek road at the National Forest boundary to the proposed new paved road would be eliminated. This alternative would affect the proposed SEUOHV Castle Valley Trail system, since OHV access would be eliminated on the new paved road and there would be no designated OHV route accessing the Water Hollow Benches. Current OHV and equestrian recreation use is low in the Water Hollow Benches area, and these users would likely be affected by reduced solitude and isolation that construction of the road and heavy coal truck traffic would bring. There would be no impact to the San Rafael Route Designation Plan.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

No further mitigation or monitoring activities are proposed for recreation resources for the Proposed Action. Under Alternative D, the big game winter range would increase through seedings supporting a larger wintering population of elk and deer. This action could increase big game numbers available for hunting.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

Implementation of the Proposed Action would result in a loss of the natural, roaded, and semi-primitive motorized dispersed type of recreation.

The loss of semi-primitive recreation opportunities, as the current dominant recreation opportunity in the area, adjacent to the proposed road would be a residual adverse impact.

**CUMULATIVE EFFECTS**

The development of the proposed road and possible future exploration/development of gas fields would permanently change the access to the area and increase industrial activity in a remote isolated area. As the area becomes more accessible, especially after the life of the mine, recreational use of the area would increase. As more recreationists utilize the area, it is likely that recreation experiences would be impacted for some. The area would be less remote. Recreation activities, such as hunting, would be affected by more intense use.

## 3.10.3 Wilderness and Congressionally Designated Areas

There are four types of wilderness designations/proposals in Utah: designated Wilderness Areas; Wilderness Study Areas (WSA); Wilderness Inventory Units (WIU) (lands identified in 1999 by the BLM as having wilderness characteristics); and proposed wilderness areas (HR 1732 lands proposed by the Utah Wilderness Coalition (UWC).

According to the BLM (Finger, 2001), WSAs are managed under the Interim Management Policy and Guidelines for Lands Under Wilderness Review. The general standard for interim management of those lands is that they must be managed so their suitability for designation is not impaired. WIUs are lands inventoried and determined to have wilderness characteristics. These areas are presently being considered for WSA status through a land-use planning process. The Department of Interior policy is that while the planning process is being completed, the management prescriptions of existing land use plans will apply to these inventory units. The BLM policy is to pay careful and particular attention to proposals that could limit Congress' ability to designate the units as wilderness. Therefore, BLM considers actions proposed in these lands on a case-by-case basis to determine potential impacts to wilderness characteristics. The HR 1732 lands are not given special consideration under present Federal government policy (Finger, 2001). The Project Area does not occur within a designated Wilderness Study Area (WSA). The closest proposed WSA is Devils Canyon, approximately 10 to 15 miles southeast of the Project Area (USDI-BLM, 1991).

There are no wilderness designations/nominations or Roadless Areas in the Project Area. The closest WSAs (BLM) are located about 15 to 20 miles southeast of the Project Area in the San Rafael Swell, as is the western boundary of the proposed San Rafael Swell National Conservation Area. The nearest Roadless Areas (USFS) are located 2.5 to 3 miles north and northwest of the Project Area in the Manti LaSal and Fishlake National Forests. However, the Fishlake National Forest does not allow motorized vehicle travel in an area that generally coincides with the Old Woman Research Natural Area (RNA), located about 0.5 mile west of the Water Hollow alternate alignment.

A Research Natural Area (RNA) is located near the Project Area on Fishlake National Forest land. RNAs are tracts of land that approximate pristine conditions and are designated for scientific and educational uses. The RNA, referred to as Old Woman Cove, was officially designated in November 1998 (USDA-USFS, 1998). It encompasses approximately 2,520 acres and is located about 0.5 mile west and south of the Water Hollow alternate alignment.

There are no non-WSA lands with or likely to have wilderness characteristics in the general vicinity of the Project Area.

### Potential Impacts To Wilderness

**NO ACTION - ALTERNATIVE A**

There would be no effect upon any WSA, WIU, UWC proposed areas, or RNA.

**BUILD ALTERNATIVES - ALTERNATIVE B, C, D**

No roadless areas are affected by the proposed Quitchupah Creek Road project or Alternatives. There would be no effect upon any WSA, WIU, UWC proposed areas, or RNA by this project.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**
No irreversible or irretrievable commitment of resources would occur as a result of the Proposed Action. No residual adverse impacts to wilderness resources are anticipated from any of the Alternatives as analyzed above.

**CUMULATIVE EFFECTS**
The implementation of the Proposed Action, in conjunction with past, present, and reasonably foreseeable future actions would not conflict with wilderness resources. There would be no cumulative effects to wilderness resources under the proposed road.

## 3.11 Areas of Critical Environmental Concern (ACECs) and Wild and Scenic River Eligibility

### 3.11.1 ACECs

Areas of Critical Environmental Concern (ACECs) are those areas managed for specific and substantial unique resource values. Areas with the potential for ACEC designation, protection, and management are identified through the BLM's resource management planning process.

The Quitchupah Creek – Trough Hollow ACEC has been nominated under the current land use planning effort for the BLM's Richfield Field Office. The ACEC would include Quitchupah Creek drainage, Link Canyon, and Trough Hollow, and would involve the majority of the EIS Project Area, excepting the Water Hollow & Saleratus benches. Under the ACEC nomination process, when both criteria (relevance and importance) are met, the area is a potential ACEC to be reviewed in the Draft RFP. The nominated ACEC met the criteria of relevance due to significant evidence of prehistoric occupation and use. The importance criterion is satisfied by significance of the cultural sites and their sensitivity to development and access. Other values include bald eagle habitat and presence of BLM sensitive Creutzfeldt flower and Federally listed last chance Townsendia.

The cultural values for the canyon are the many documented Fremont and Archaic habitation sites and use areas as well as the more recent historic activity.

This area overlaps the Old Woman Plateau that includes the Old Woman Cove RNA, found relevant and important for relict value. The Forest Service designates and manages a network of special areas on Forest lands that are permanently protected and maintained in natural conditions, for the purposes of conserving biological diversity, conducting non-manipulative research and monitoring, and fostering education. RNAs include: high quality examples of widespread ecosystems, unique ecosystems or ecological features, and/or rare or sensitive species of plants and animals and their habitat. The Old Woman Cove RNA is not within the proposed Project Area.

**Potential Impacts To ACEC's**
**NO ACTION - ALTERNATIVE A**
There would be no impacts to the proposed Quitchupah Creek – Trough Hollow ACEC under the No Action Alternative. Current impacts (erosion, grazing, etc.) to these values would continue.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**
Alternative B would negatively impact six eligible cultural resource sites (See **Section 3.12**) through archaeological excavation and destruction due to construction of the proposed road. This would impact the values for which the ACEC was nominated in Quitchupah Creek drainage. However, current impacts to these values would be lessened through erosion control, livestock trail and fencing, and other management.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**
Alternative C would negatively impact ten eligible cultural resource sites (See **Section 3.12**) through archaeological excavation and destruction due to construction of the proposed road. This would impact the values for which the ACEC was nominated in both Quitchupah Creek drainage and Link Canyon. However, current impacts to these values would be lessened through erosion control, livestock trail and fencing, and other management.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**
Under Alternative D, the proposed road would avoid the eligible cultural resource sites in the Quitchupah Creek drainage and Link Canyon. It would not compromise the values for which the ACEC was nominated. Further, current impacts to these values would be lessened through erosion control, livestock trail and fencing, and other management.

## 3.11.2 Wild and Scenic River Eligibility

Quitchupah Creek, from the Fishlake National Forest boundary to the Sevier/Emery county line (crossing 1.4 miles of BLM land) was found to be eligible for possible designation as a wild and scenic river during the initial phase of Richfield BLM's land use planning update process. The March 2005 Wild and Scenic River Eligibility and Tentative Classification Report determined that the river was eligible for its outstandingly remarkable cultural resource value. It was tentatively classified as a recreational river. Once a river segment crossing public lands has been determined as eligible, the river corridor is managed to protect the outstandingly remarkable values for which it is nominated, until a suitability determination is made.

**Potential Impacts To Wild And Scenic River Eligibility**

**NO ACTION - ALTERNATIVE A**
There would be no impacts to the eligible values of the nominated Scenic River segment under the No Action Alternative. Current impacts (erosion, grazing, etc.) to these values would continue.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**
Alternative B would impact six eligible cultural resource sites (see **Section 3.12**) through mitigative archaeological excavation and subsequent destruction due to construction of the proposed road. This would impact the eligible values for which the Scenic River segment was nominated in Quitchupah Creek drainage. However, current impacts to these values would be lessened through erosion control, livestock trail and fencing, and other management.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**
Alternative C would impact five eligible cultural resource sites through mitigative archaeological excavation and subsequent destruction due to construction of the proposed road. This would impact the eligible values for which the Scenic River segment was nominated in Quitchupah Creek drainage. However, current impacts to these values would be lessened through erosion control, livestock trail and fencing, and other management.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

Under Alternative D, the proposed road would avoid the eligible cultural resource sites in the Quitchupah Creek drainage. It would not compromise the eligible values for which the Scenic River segment was nominated. Further, current impacts to these values would be lessened through erosion control, livestock trail and fencing, and other management.

## 3.12 Cultural and Paleontological Resources

Cultural resources are districts, sites, structures, objects, and other evidence of some importance to a culture, a subculture, or a community for scientific, traditional, religious, and other reasons. These resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of cultural development (McGimsey and Davis 1977:110).

Paleontological resources are the recognizable remains, such as bones, shells, leaves, or other evidence, such as tracks, burrows, or impressions, of past life on Earth (USGS 2004).

**REGULATORY FRAMEWORK**

The National Historic Preservation Act (NHPA) and Executive Order (EO) 11593 require the protection and enhancement of cultural resources by the Federal government. The Section 106 process of the NHPA requires consultation with the appropriate agencies to develop and evaluate Alternatives or modifications to all of the proposed undertakings for this project in order to avoid, minimize or mitigate adverse effects on all historic properties.

Section 106 Regulations 36 CFR 800.5 and 800.6 detail the process by which agencies determine whether undertakings will adversely affect historic properties and how the agencies consult to avoid, minimize, or mitigate the adverse effects in order to meet Section 106 requirements. The Advisory Council on Historic Preservation's (ACHP) Section 106 Regulations Archeology Guidance document states: "Methods for recovering information from archeological sites, particularly large-scale excavation, are by their nature destructive. The site is destroyed as it is excavated. Therefore management of archaeological sites should be conducted in a spirit of stewardship for future generations, with full recognition of their non-renewable nature and their potential multiple uses and public values...Given the non-renewable nature of archeological sites, it follows that if an archaeological site can be practically preserved in place for future study or other use, it usually should be..." Data recovery in the form of excavation or artifact collection is considered an adverse effect. Therefore, data recovery may not always be considered a viable mitigation possibility to achieve no adverse effects for impacts to eligible cultural resource sites.

Consultation with Native American tribes has been on-going throughout the NEPA process and has been conducted under the approach that Quitchupah Creek and surrounding areas, not just the individual sites, are the important component for Native American concerns. Native American consultation is addressed in **Section 3.13**, Native American Concerns.

**AFFECTED ENVIRONMENT**

Previous inventories conducted in the Project Area have resulted in the identification and recordation of numerous site types including historic cabins/ranches, historic road segments, historic debris scatters, historic inscriptions, as well as prehistoric villages, campsites, rockshelters, and rock art (petroglyphs and pictographs). The rock art represents the Archaic, Fremont, Ute, and possibly Paiute cultures. The data suggests that the identified sites along the proposed Quitchupah Creek Road were primarily occupied

during the Formative Fremont culture. More limited occupations are also suggested for the preceding Archaic period. Little evidence of the Numic period has been found at the sites identified in the Project Area, but may be evident in the rock art present in the canyon.

Cultural resource inventories specific to the proposed build alternatives were conducted. Inventory corridors were wider than the actual proposed construction corridor in order to provide some flexibility to avoid sites.

Past and present impacts to cultural resources within the Project Area include cattle grazing/trailing, power line construction and maintenance, road maintenance, recreational activities (ATV use), vandalism, collection of artifacts, and erosion. Construction of the existing road and power line has directly damaged, and in one case buried, cultural resource sites.

**PREHISTORY**

A number of overviews have been written for the region and adjacent regions including Jennings et al. (1974, 1978, 1980, 1986), and Aikens (1970), Madsen (1980), and Aikens and Madsen (1986). Madsen (1982) also presents a model of the prehistory of the region that includes the following: Paleoindian (12,000-9,000 Before Present (B.P.)), Archaic (8,500-1,600 B.P.), Formative Fremont (1,600-650 B.P.), and Numic (700 B.P.-present). Below is a brief summary and overview of the periods represented in the prehistoric sites in the Project Area.

*Archaic*

The Archaic period (8,500-1,600 B.P.) is well represented in Utah. The Archaic lifeway was highly adaptive, based on hunting and gathering subsistence practices. Archaic subsistence included a wide array of food sources. During the earlier stages of this period, Archaic people resided around pluvial lake margins and riverine environments. Later, in response to the decline of these ecozones, population shifted to upland areas to take advantage of available resources. Cultural remains from this period include items such as metates, baskets, bone implements, and variety of diagnostic projectile points. Common point types include Elko and Humboldt series, Pinto, Sudden Side-notched, and Gypsum. Evidence of the Archaic period is exhibited by recorded surface sites and rockshelters throughout the region. Rockshelters and cave sites have been the primary means for defining what is known about the culture.

*Fremont*

The Fremont inhabited the region between 1,600-650 B.P. (Jennings et al. 1978). They were horticulturalists with varying dependencies on corn, beans, and squash. The Fremont also hunted small and large game animals and utilized wild plant foods. They built semi-subterranean pit houses, surface jacal and masonry habitation units and coursed adobe granaries. The remains of the structures often appear as low-lying mounds in valleys, and on alluvial fans and ridge tops. Diagnostic artifacts from this period include the Utah type metate, clay figurines and small to medium size corner-notched projectile points. Ceramics consist mostly of graywares, but also include some corrugated, incised, and black-on-white styles.

*Numic*

Numic speaking groups appear to have replaced the Fremont after about 700 B.P., during the late Prehistoric period. These groups relied on a hunter-gatherer lifestyle, similar to that of the Archaic. They lived in temporary brush wickiups and rockshelters (Steward 1938). These groups depended on a variety of wild plants, and employed seasonal movements; gathering resources produced in various ecological zones. Evidence of the Late Prehistoric period comes from surface sites, containing light artifact remains, and shallow rockshelter deposits. Diagnostic artifacts include non-painted brownware ceramics and the Desert Side-notched point.

**Site Summary for the Quitchupah Creek Road (Alternative B)**
Six projects were previously completed in the proposed Quitchupah Creek Road corridor (Alternative B), resulting in 24 sites in the Convulsion Canyon/Quitchupah Creek area. James Gunnerson performed the earliest archaeological work along Quitchupah Creek, in the 1950's, during his explorations of central Utah (Gunnerson, 1969). His work recorded some of the more major sites in the canyon. These sites were revisited by Brigham Young University (BYU) crews in 1977 and again by Archaeological Environmental Research Corporation (AERC) in 1995.

A power line corridor for Utah Power was inventoried in 1977 by BYU. Eight sites were identified during that inventory (Berge, 1977). Many of these sites were revisited and site forms updated by AERC (Hauck, 1995) for SUFCO Mine as part of the Quitchupah Creek Road Project. AERC inventoried a 200 foot wide corridor, expanding to 1,200 feet between the Water Hollow junction and the North Fork junction, along the length of the existing 9.15 mile Quitchupah Creek Road. Another small inventory was completed by Montgomery Archaeological Consultants, Inc. (MOAC) in 2002, south of the rock art area (Raney and Montgomery, 2002). MOAC inventoried an area 1,200 feet by 350 feet wide south of the AERC corridor in order to reroute the proposed road away from rock art. Three new sites were encountered and one previously recorded site was updated within the inventory area. The BLM recorded sites in 1985 that were not associated with a particular project. In 2003, one site within the Quitchupah Creek Road corridor was re-inventoried and re-evaluated by JBR Environmental Consultants, Inc. (Prince-Mahoney, 2003).

In total, 24 sites were recorded as a result of these inventories, 18 prehistoric sites, 5 historic sites, and 1 multi-component historic/prehistoric site. Of the sites encountered, 16 are eligible for the NRHP. The remaining eight sites are ineligible. Generally, the prehistoric sites represent Archaic and Fremont cultures. Six of the 24 sites contain rock art. **Table 3.12-1** presents a summary of the six cultural resource sites in the proposed road construction corridor.

**Table 3.12-1 Eligible Cultural Resource Sites within the Quitchupah Creek Road Corridor, Alternative B**

| Site Type | Affiliation | Land Status |
|---|---|---|
| Occupation/Lithic Scatter* | Unknown | BLM |
| Rockshelter/Occupation* | Unknown | BLM/private |
| Occupation* | Unknown | SITLA |
| Ghost Figure Rock Art Site* | Archaic | BLM |
| Ranch Site* | Euro-American | Private |
| Pithouses | Fremont | Private |

* These sites would also be impacted under Alternative C

In the Quitchupah Creek area there is an abundance of rock art, both petroglyphs and pictographs; these represent the Archaic (Barrier Canyon Style, Glen Canyon Style 5), Fremont, Ute, and possibly Paiute cultures (Sucec, 2002). Three of these prominent sites include the North Fork Rock Art site, the West Point site, and the Ghost Figure site. The presence of several rock art styles indicates that the area was utilized for thousands of years. The styles exhibited and the groups associated illustrate a common attraction and uniqueness to the area.

Rock art can reveal much information about prehistoric use, including who utilized the area and when, movement over time and space of cultures, and possibly interactions between the cultures. As the study of rock art continues, these sites have the potential to provide information such as temporal association,

settlement patterns, technology, knowledge of seasons and calendars, cultural interactions or transformations, and possibly visual communication systems.

One study of the rock art in the Quitchupah Creek area discusses the different styles present as including the Barrier Canyon Style, Glen Canyon Style 5, later Basketmaker, figures with a strong Rochester Creek Style flavor, two different periods of Fremont, and Ute (Warner, 1991). The Archaic time period, to which the Glen Canyon Style 5 and the Barrier Canyon Style are attributed, has a proposed beginning date of about 6,000 years ago (Cole, 1990). The other rock art styles represent time periods of A.D. 450 to 750-800 (later Basketmaker), A.D. 400 to 1500 (Fremont), and A.D. 1600 to 1880 (Ute) (Cole, 1990).

According to the Utah Archaeological Research Institute, this location of the Glen Canyon Style 5 images is one of the most northwestern sites of this style (Manning, 2002). In addition, the combinations of Barrier Canyon Style and Fremont Style suggest interactions of the various cultures (Manning, 2002) or possibly the transformation of a people from hunting and gathering to a more settled lifeway (Sucec, 2002). The variety of images and cultural associations represented make these panels distinctive and valuable for the information they may provide to our knowledge of the prehistory of the area as well as the prehistory of the western United States.

**Site Summary for the Alternate Junction And Alternate Design (Alternative C)**

The Class I file search found no previously recorded sites located within the Alternate Junction segment (Alternative C) corridor. The previous projects completed in the area include those described for the Quitchupah Creek (Alternative B) corridor. A Class III inventory was completed for Alternative C in July 2001 (Patterson and Montgomery, 2001). In 2003, another Class III field survey was completed by MOAC (Guilfoyle and Montgomery, 2003) for a reroute of Alternative C further to the north. This northern route is now the desired route for Alternative C, in order to avoid a private land parcel.

A total of 15 sites were recorded along this inventory corridor. MOAC (Guilfoyle and Montgomery, 2003) identified a total of 14 newly recorded sites and one previously recorded site. The inventory corridor was 500 feet wide and then slightly expanded at the drainages. Twelve prehistoric and three historic cultural resource sites were encountered; all twelve prehistoric sites are eligible for the NRHP and the three historic sites are ineligible. Four of the prehistoric sites are affiliated with the Fremont culture; the remaining eight are of unknown affiliation. The historic sites include a segment of the *Quitchumpah to Emery Road,* a possible Numic Indian trail, and a historic trash scatter. **Table 3.12-2** identifies the eligible cultural resource sites within the proposed Alternative Junction with SR-10 segment of the Alternative C construction corridor. In addition, five of the six sites (**Table 3.12-1**) impacted under Alternative B would also be impacted by Alternative C where the two alternatives are within the same corridor.

**Table 3.12-2 Eligible Cultural Resource Sites within the Alternate Junction with SR-10 Segment of Alternative C**

| Site Type | Cultural Affiliation | Land Status |
|---|---|---|
| Campsite | Fremont | BLM |
| Lithic and Ceramic Scatter | Fremont | BLM |
| Lithic and Ceramic Scatter | Fremont | BLM |
| Campsite | Unknown | Private |
| Campsite | Unknown | Private |

**Site Summary for the Water Hollow Alternate Alignment (Alternative D)**
The Class I file search identified that four previous inventories were conducted in the vicinity of the Water Hollow Road, Alternative D corridor. These projects included the 1977 powerline inventory, a sampling inventory, a seismic line project inventory, and the 1995 Quitchupah Creek Road inventory. Only one previously recorded site was noted to be within the route corridor. The class III inventory was completed for the Water Hollow route in 2000 by JBR Environmental Consultants, Inc. (Crosland and Billat, 2001).

The survey corridor for this alignment varied from 500 to 1,000 feet in width so that the proposed road corridor could be routed to avoid all cultural resources. Nineteen sites were identified by JBR during the Class III field inventory conducted in 2000 (Crosland and Billat, 2001) along the Water Hollow Route. Of the 19 sites encountered, 12 are prehistoric, 2 are multi-component prehistoric/historic, and 5 are historic. The prehistoric sites with diagnostic artifacts are associated with the Fremont culture. Ten of the sites are eligible for the NRHP, nine are ineligible. All 19 of these sites would be avoided by Alternative D as they are outside the proposed construction corridor.

**Paleontological Resources**
A file search performed by the Utah Geological Survey (UGS) indicated that no paleontological localities had been previously recorded along any of the possible project corridors (Hayden, 1999-2000). Formations exposed in the right-of-way include the Blue Gate Shale Member, Emery Sandstone Member, and Masuk Shale Member of the Mancos Shale; the Star Point Sandstone; and the lower part of the Blackhawk Formation. There is a slight possibility of vertebrate fossils and dinosaur tracks in the Blackhawk Formation which is located on the very west end of the project, near Acord Lakes Road. Overall, there is a low potential for significant fossil localities to be found within the Project Area.

A paleontological inventory was performed on Alternative B and Alternative C corridors in July 2002 (Hamblin, 2002a). The inventory resulted in the recordation of several invertebrate marine and plant fossil sites within Emery Sandstone. No significant fossil localities were encountered. Dinosaur tracks were noted in rocks that had rolled down from the Blackhawk Formation (outside project corridor) to their present location. This track site is considered "important" in that it is an indicator that dinosaur tracks can be expected within the Blackhawk Formation, but is not in-situ within the corridor. Alternative D traverses the same geologic formations described above and similar sites could be expected. The paleontological report can be found in the Technical Report Addendum (JBR, 2002).

## Potential Impacts To Paleontological And Cultural Resources

The Environmental Consequences of each Alternative, in regard to these resources, are discussed below. First, impacts to paleontological resources and then cultural resources.

### POTENTIAL IMPACTS TO PALEONTOLOGICAL RESOURCES

**All Alternatives**
Unless significant fossil localities are discovered as a result of construction activities, this project would have no direct, indirect, or cumulative impact on significant paleontological resources. No significant in-situ fossil locations have been identified in the Project Area.

### POTENTIAL IMPACTS TO CULTURAL RESOURCES

Direct impacts to cultural resources, depending on the Alternative chosen, could include site destruction, loss of integrity, and increased erosion. See **Section 3.3 Soils** for a discussion on erosion within the Project Area. Indirect impacts include possible collection of artifacts and vandalism from increased accessibility and use of the area.

**NO ACTION - ALTERNATIVE A**

No cultural resources would be impacted by this proposal under the No Action Alternative. Cultural resources in the Project Area have been impacted by power line construction and maintenance, road construction and maintenance, mining activities, farming and grazing activities, recreational uses (hunting, ATVs, etc.), vandalism, and erosion. These impacts would likely continue under the No Action Alternative.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**

Of the 24 cultural resources sites within the Alternative B corridor, six NRHP eligible cultural resource sites would be within the construction corridor of the proposed Quitchupah Creek Road (**Table 3.12-1**). The remaining identified 18 sites are either ineligible for the NRHP or are outside the construction corridor.

Direct impacts to eligible cultural resource sites within the Alternative B route would be major and irreversible. A total of six eligible cultural resource sites within the Alternative B corridor could not be avoided and would be destroyed by construction activities. These impacts could be mitigated through excavation and data recovery. Under this Alternative, the land managing agency, in coordination with the State Historic Preservation Office (SHPO) and consulting parties (tribes), would need to design measures to minimize or mitigate impacts to the sites. The loss of the in-situ site is considered an "Adverse Effect". These in-situ cultural resource sites would be irreversibly lost.

The alignment would place the proposed road about 300 feet away and across the creek from the majority of the rock art panels, which are located north of the creek. Though these rock art panels would be avoided, indirect impacts to these resources would be an important issue upon completion of a paved road.

Indirect impacts, such as erosion, unauthorized excavation, collecting, and vandalism, to nearby eligible cultural resource sites would remain similar to existing levels.

Because of the steep and variable topography of the canyon itself, sections of the road alignment would be filled or cut into the canyon bottom. Buried cultural materials could possibly be encountered during these excavation activities. Applicant committed measures would include a monitoring plan to be implemented during project construction for the discovery of unknown buried cultural remains.

The junction of the proposed road with SR-10 would require UDOT right-of-way or acquired right-of-way. This area would need to be inventoried for cultural resources prior to any construction activities; therefore potential impacts for this area are not known at this time.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**

Direct and indirect impacts to sites along the Alternative C route would be similar to those discussed in Alternative B. Five of the eligible sites along Alternative B (**Table 3.12-1**) and another five eligible sites along Alternative C (**Table 3.12-2**) would be directly impacted if this route were selected. These sites could not be avoided and would be destroyed by construction activities. Under this Alternative, the land managing agency, in coordination with the State Historic Preservation Office (SHPO) and consulting parties (tribes), would need to design measures to minimize or mitigate impacts to the sites. The loss of the in-situ site is considered an "Adverse Effect". These cultural resource sites would be irreversibly lost.

Indirect impacts, such as erosion, unauthorized excavation, collecting, and vandalism, to nearby eligible cultural resource sites would remain similar to existing levels.

The junction of the proposed road with SR-10 would require UDOT right-of-way or acquired right-of-way. This area would need to be inventoried for cultural resources prior to any construction activities; therefore potential impacts for this area are not known at this time.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

No eligible cultural resource sites are located within the proposed construction corridor; therefore, there would be no direct impacts to cultural resource sites as a result of Alternative D. Indirect impacts could occur as a result of increased public access and use of the area for recreational purposes. These indirect impacts would be similar to those discussed in Alternatives B and C.

The junction of the proposed road with SR-10 would require UDOT right-of-way or acquired right-of-way. This area would need to be inventoried for cultural resources prior to any construction activities; therefore potential impacts for this area are not known at this time.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

**Paleontological Sites**

Monitoring for paleontological resources would be required on the west end of the proposed road, near Acord Lakes Road, if excavation were to occur in the Blackhawk formation. A qualified paleontologist should be present to look for dinosaur tracks and other vertebrate fossils. There would be a possibility of encountering Pleistocene fossils in the alluvium in the canyon. If fossils were encountered during construction, work in that area would be halted until a qualified paleontologist could evaluate it and make recommendations. Once agency-approved appropriate mitigation were executed and completed, work could resume.

**Cultural Resources**

For site preservation, avoidance of impacts to eligible and unevaluated cultural resource sites is the preferred method of site preservation. However, when disturbance of NRHP eligible sites is unavoidable, direct and/or indirect impacts could be mitigated through data recovery, site monitoring, and research in accordance with standards and guidelines outlined in NHPA Section 106 (36 CFR 800.5 and 800.6) and the ACHP's Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites. Mitigation would need to be agreed upon by the land managing agency (USFS, BLM, SITLA), SHPO, the Native American tribes (consulting parties), and ACHP. However, both direct and indirect impacts would result in permanent loss of site context, and especially in the case of indirectly impacted sites, potential loss of information and artifacts.

Specific cultural mitigation would be dependant on which Alternative were chosen but may include data recovery, additional recordation/mapping, historic research, oral interviews, site enhancement/conservation, and/or public exhibits and education. The mitigation required would compensate, reduce, or eliminate impacts to eligible cultural resources. After the RODs are issued, a Research Design would be required for the sites along the chosen Alternative and approved by the SHPO and administering land agency (BLM, USFS, SITLA). A Memorandum of Agreement between the SHPO, Federal agency(ies), and other consulting parties, such as Native American tribes, would need to be completed. Consultation with the tribes would be on going during this process.

Costs and time involved for mitigation would vary greatly depending on the Alternative chosen. Cultural resource mitigation for Alternatives B and C would likely be more extensive than Alternative D. Alternatives B and C have several NRHP eligible cultural resource sites within the construction corridor, whereas Alternative D has no NRHP eligible sites within the corridor. Alternatives B and C would cause direct impacts to eligible sites; Alternative D would possibly contribute to indirect impacts to sites outside

the corridor. Monitoring for subsurface cultural deposits during construction activities, by a qualified archaeologist, would be required for Alternatives B, C, and D, as stated in the Mitigation and Monitoring Plan.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

Data recovery and subsequent road construction would result in the permanent loss of the in-situ cultural resource. Loss of cultural resource sites, artifacts, or context would be irretrievable. Filling over cultural resource sites would be an irreversible adverse impact. Residual adverse impacts to cultural resources would include compromised site integrity due to physical damage to the sites during construction or use of the proposed road. The presence of a new road could lead to increased access to site locations resulting in site disturbance, artifact collection, and vandalism.

**CUMULATIVE EFFECTS**

Past actions concerning cultural resources within the Project Area include cultural resource surveys that have identified prehistoric and historic sites. Construction of the existing dirt road and power line has damaged, and in one case buried, cultural resource sites. Cattle grazing, ATV use, and possibly other recreational activities have also disturbed the cultural resources. Additional adverse impacts are the result of unauthorized excavations, surface collection, and vandalism of cultural resource sites. Present and future impacts will be attributed to these same factors. The direct impacts under the Proposed Action and Alternative C would essentially destroy or compromise the integrity of several eligible sites within the road corridor; these impacts could be mitigated through data recovery. Indirect impacts could compromise the integrity of other nearby sites, including the rock art sites. Cumulative impacts to cultural resources under Alternatives B and C would likely be substantial and significant.

Past actions concerning cultural resources along the Alternative D route include cultural resource surveys that have identified prehistoric and historic sites, some of which are recommended eligible for inclusion on the NRHP. Cattle grazing, chaining and seeding, ATV use, and possibly other recreational activities have disturbed the archaeological resources. Additional adverse impacts are the result of unauthorized excavations, surface collection, and vandalism of archaeological sites. Present and future impacts will be attributed to these same causes. In addition, there could be impacts from future oil and gas exploration (see **Section 3.9** Land Use). There would be no direct impacts from implementation of Alternative D to cultural resources sites to add to cumulative effects. Indirect impacts, such as surface collection and vandalism, could compromise the integrity of nearby sites. Cumulative adverse impacts to cultural resources under Alternative D would likely be minor. Degradation and loss of integrity to cultural resource sites will continue to increase with the development of the area.

## 3.13 Native American Concerns

**INTRODUCTION**

Consultation with Native American tribes has been on-going throughout the NEPA process and has been conducted under the approach that Quitchupah Creek and surrounding areas, not just the cultural resource sites, are the important component for Native American concerns. The BLM Richfield Field Office has been the primary contact with the Native Americans for this project.

**REGULATORY FRAMEWORK**

Federal agencies are required by law (National Historic Preservation Act (NHPA) of 1966) and regulation to consult with Native Americans on actions that may affect their traditions or uses of public lands. Specifically the agencies are required to follow the Section 106 process as recorded in 36 CFR 800 - Subpart B as amended August 5, 2004. Native Americans should comment on proposed actions and

participate in decisions prior to implementation, as the product of consultation. The goal of the BLM Manual Section 8160 is to "assure that tribal governments, Native American communities, and individuals whose interests might be affected have a sufficient opportunity for productive participation in BLM planning and resource management decision making." To this end, the Richfield Field Office BLM, in conjunction with Fishlake National Forest, has engaged in consultation with the Native Americans. Native American consultation included the Paiute Indian Tribe of Utah, the Ute Indian Tribe, the Hopi Tribe, and the Navajo Nation.

The Archaeological Resources Protection Act (ARPA) of 1979 applies to any agency that receives information that a direct or federally assisted activity could cause irreparable harm to prehistoric, historic, or archaeological data. ARPA is enacted if a project requires issuance of a permit for the excavation and removal of archaeological resources. The consultation requirement in ARPA pertains to the issuance of permits.

The American Indian Religious Freedom Act (AIRFA) of 1978 states "...henceforth it shall be the policy of the United States to protect and preserve for American Indians their inherent right to freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites [42 United States Code (U.S.C.) 1996]." Agencies are required to review their policies and procedures in consultation with traditional native religious leaders.

Executive Order (EO) 13007 - Indian Sacred Sites requires agencies to accommodate access to and ceremonial use of Indian sacred sites and to avoid adversely affecting the physical integrity of said sites. According to EO 13007, a sacred site is defined as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." Sacred sites may consist of a variety of places and landscapes, such as springs, mountains, canyons, caves, and archaeological sites.

There are many places on Federal lands where Indians practice their religions. Many of the lawful activities that are permitted and authorized on Federal lands can compromise the integrity of sacred places and the privacy of religious practices. With this in mind, EO 13007 was signed, "in order to protect and preserve Indian religious practices". The order obligates Federal land managers to work with Indian tribes to help protect their basic rights and practice their religions. When planning and implementing land uses, agencies generally have the ability to accommodate tribal access to sacred sites and to prevent physical damage or intrusions that might impede their use – if it is known that the sites exist.

The discretion of the Federal land manager is exercised in guaranteeing access to the site and in how or if the physical integrity of the sacred site is preserved. EO 13007 states that impacts to the physical integrity of sacred sites are to be avoided "to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions". The policy created by this clause says the Federal land manager will do as much as possible to protect sacred sites from harm, in light of the conditions at hand and using the technical means available, while acting within agency authority and fulfilling the agency's public purpose.

## AFFECTED ENVIRONMENT

**Section 3.12 Cultural and Paleontological Resources** contains a prehistory of the region. The cultural resource sites, as discussed in **Section 3.12**, indicate long-term use of the Project Area by Native Americans. The rock art and diagnostic artifacts present indicate use of the area by Archaic, Fremont, Ute, and possibly Paiute cultures.

Historic General Land Office maps of the area also indicate use of the area by Native Americans. GLO maps from 1873, 1874, and 1891 note "Indian Trails" through and in the vicinity of the Quitchupah Creek area.

## NATIVE AMERICAN CONSULTATION

Native American consultation has been ongoing during the NEPA process. The tribes actively involved in the Native American consultation have been the Paiute and Ute, while the Navajo and Hopi have deferred to the Paiute. The Paiute and Ute tribes accepted consulting party status. Field meetings, presentations at tribal council meetings, agency-tribal meetings, and verbal and written communication have been utilized to keep the tribes informed and apprised of the proposed project.

The Paiute claim the Quitchupah Creek area as sacred and oppose the proposed road in the canyon. The Hopi have expressed interest in the Fremont sites and any activities that may affect them. Generally the Ute's concern extends to all of the sites in the canyon but focuses on the rock art; they have requested a 0.5 mile buffer for protection of the rock art sites. The Navajo support the claims of the Paiute and Hopi. Details of the Native American consultation can be found in **Appendix E**.

In summary, the tribes actively involved in the Native American consultation were the Paiute, Ute, and Hopi tribes, all of whom have expressed that they want all of the identified cultural resource sites within the Project Area to remain undisturbed and intact, especially the rock art complex at North Fork. The Navajo and Hopi have deferred to the Paiute Tribe and support their claims.

## ETHNOGRAPHIC STUDY OF THE QUITCHUPAH CREEK AREA

During consultation, the Paiute Tribe expressed that the Quitchupah Creek area is sacred to them. As stated in EO 13007, a sacred site is "any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion." There exist different professional positions as to the affiliation between Fremont peoples and Numic peoples, geographic distribution of the Indian Tribes, and the accuracy of assigning rock art to cultural periods without studies that include datable materials. EO13007 directs federal agencies to provide access to and use of sacred sites and to avoid adversely affecting the physical integrity of them but does not mandate a review of sacred claims by a federal agency. In order to document and clarify the sacred site, an ethnographic study of the Paiute and their association with the Quitchupah Creek area was undertaken (Stoffle et al., 2004). This study, *Quitchupah Creek Ethnographic Study for the Proposed Quitchupah Creek Coal Haul Road*, was headed by Dr. Richard Stoffle of the University of Arizona.

The field studies occurred between May 18 and May 21, 2004; studies included a visit to the Quitchupah Creek area by Tribal elders, ethnographers, and the archaeologist from the Richfield Field Office BLM. During this time, the group visited fourteen prehistoric archaeological sites. These areas were selected based on the potential impacts the Action Alternatives would have on these locations. These sites comprise six Indian "places", as denoted by the Paiutes. A "place" is derived from the power it exhibits. The power that defines a "place" can be significant inherent natural qualities, or the production and

recognition of meanings in particular places, or events that have taken place at that location. Interviews with Tribal elders were conducted at each of these "places". Interviews focused on cultural, religious, traditional, and other connections with specific places (site interview); significance of rock art to the individual and the Tribe (rock art interview); and associations, paths, and connections between localized portions of the Study Area (cultural landscape interview). This information was then contextualized to provide insight into the significance of the entire area and the importance of specific places.

Many of the sites visited by the elders were described as having connections to other sites within the canyon, and at least one of the sites was an aggregate of multiple sites comprising a much larger single site or "place". The elders voiced concerns for a variety of resources such as archaeology sites, plants, animals, water, and the canyon itself. Each of these resources has significance in Southern Paiute culture. Archaeology sites are respected as places their ancestors used. Plants have significance for their many uses. Plant communities at a site can increase its cultural significance for Indian people, in that many plants are still used by members of the community. Further, animals are significant both as a resource and as entities to be reckoned with or as co-residents of an area. Water is significant because it is necessary for the survival of all creatures, and it carries "puha", the energy essence of the universe, down from the mountains. Also, geographic features such as the canyon itself are important to Indian people. Canyons are places within mountains, and are therefore conduits for "puha" to flow from the mountains for the use of people. Often canyons are places that offer a unique combination of resources, which Indian people need for their physical and spiritual well-being.

In summary, the ethnographic study supports the Quitchupah Creek area as sacred to the Paiute Indian Tribe of Utah. According to the ethnography, the area contains medicine/spiritual places, social and plant gathering places, and farming areas. The topographic features of the area contribute to the sacredness in relation to the flow and convergence of "puha" (Stoffle et al., 2004). According to the ethnographic study, the area was utilized for ceremonial activities in response to the presence of "puha". In a letter dated October 5, 2004, the Paiute Tribe expressed their satisfaction with the ethnographic study and stated their support of Alternative D, the Water Hollow route.

## Potential Impacts To Native American Concerns

**REGULATORY**

AIRFA and EO 13007 do not specify criteria for determining whether a project will affect sacred sites or religious sites. That determination must be made by the Native Americans themselves. Sacred sites are not subject to the review that is common with compliance with Section 106 of the National Historic Preservation Act. Section 106 compliance typically includes detailed review by not only the involved Federal agency, but also the appropriate SHPO and the Advisory Council on Historic Preservation and deals mainly with project effect on and mitigation of cultural resources. There is no such review in the case of sacred sites. They are a National Environmental Policy Act issue and have to be treated carefully in any land-use planning and decision-making. Many of the lawful activities that are permitted on Federal lands can compromise the integrity of sacred places and the privacy of religious practices. With this in mind, EO 13007 on Indian Sacred sites was signed "in order to protect and preserve Indian religious practices". The order obligates Federal land managers to work with Indian tribes to help protect their basic rights and practice their religions. For the purposes of this project, a project effect is considered significant if it restricts access to or affects the physical integrity of such sites. Once areas of Native American concern were established, effects were considered on the following significance criteria:

- access reduced or lost (EO 13007)
- physical disturbance or destruction (EO 13007, NHPA)

- alteration of its setting (NHPA)
- visual, noise, or other elements that are out of character for the area (NHPA)
- area rendered unsuitable or unusable for traditional/religious use (EO 13007)

The following Native American concerns were identified:

- Sacred sites (as defined in EO 13007) - Quitchupah Creek and canyon
- Traditional Cultural Properties (TCPs) (as defined in NHPA) – Quitchupah Creek and canyon have been recommended for special management designation by the Paiutes, possibly as a TCP (Stoffle et al. 2004)
- Locations of traditional importance - Rock art complex near Quitchupah Creek (see also **Section 3.12**, Cultural Resources)

**NO ACTION - ALTERNATIVE A**

There will be no adverse effects to Native American concerns under Alternative A - No Action. Adverse impacts to locations of traditional importance resulting from recreational activities, possible vandalism, and cattle grazing/trailing would continue.

**QUITCHUPAH CREEK ROAD - ALTERNATIVE B**

This Alternative would be in conflict with Native American concerns, as expressed during consultation with the tribes. Quitchupah Creek and canyon, considered sacred to the Paiute, would be physically disturbed and the setting would be altered. As elicited during Native American consultation, the rock art complex, an area of traditional use, would be adversely impacted by alteration to its setting and the introduction of noise (coal trucks) and visual elements (paved road and truck traffic) not characteristic of the area. According to the Paiute Tribe of Utah, this would render the area unsuitable for traditional uses.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**

This Alternative shares the route with Alternative B except for the easternmost two miles where it deviates northeasterly to cross Link Canyon and junction with SR-10. This alternative would be in conflict with Native American concerns, as detailed in Alternative B.

**WATER HOLLOW ROUTE - ALTERNATIVE D**

This alternative may be acceptable in relation to Native American concerns, as physical disturbance and construction in most of Quitchupah Creek and canyon would be avoided other than the uppermost two miles. This alternative would alter the setting of the canyon due to the presence of coal trucks passing through the upper portion of the canyon heading up Water Hollow and onto the upper benches, which would be visible and audible from Quitchupah Creek and canyon. In a letter dated October 5, 2004, the Paiute Tribe has expressed support of this action alternative.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

No mitigation or monitoring is proposed for Native American Concerns.

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

According to comments received from the Tribes during consultation and the ethnographic data, the sacred nature of the Quitchupah Creek area, including elements such as the rock art and remoteness of the area, would be irretrievably and possibly irreversibly altered by the construction and operation of a public road under Alternatives B and C. An area identified for traditional use would be rendered unusable under Alternatives B and C; this would be an irretrievable loss. The presence of a road and the subsequent truck traffic would be a residual adverse impact.

**CUMULATIVE EFFECTS**
Past actions affecting Native American concerns within the Project Area include construction of the existing road and power line. Vandalism to the rock art and other prehistoric sites, unauthorized excavation of sites, recreational use, and cattle grazing/trailing have also impacted the area. Excavation of cultural resource sites as mitigation for cultural resource impacts would further affect Native American Concerns. According to concerns stated during the Native American consultation and the ethnographic study, cumulative adverse impacts to Native American concerns under implementation of Alternatives B and C would likely be substantial; cumulative effects to Native American concerns under Alternative D would likely be minor to moderate.

## 3.14 Transportation

The existing road in Quitchupah Creek was originally an old wagon road prior to 1900. It served ranches, allowed access to the forest up on the plateau, and provided a route for east-west travel. The road was possibly graded in the 1940's, and the earliest road maintenance logs are dated 1968. More recently Emery County maintains a gravel surface for the first half-mile going west from SR-10, with the remainder being a native surface. The easements for the road are based upon use (Funk, 1999).

Alternatives B and C would be located along the existing two-track road, the Quitchupah Creek Road #908, through Convulsion Canyon and Quitchupah Creek canyon. The alignment begins near the SUFCO Mine on the Acord Lakes Road and heads east down Convulsion Canyon on FS road 40006 to BLM road #908 to SR-10 (**Figure 1-1**). Currently, this road has a native (dirt) surface with some gravel on the last 0.5 mile before the highway and in other areas which have resulted from scarifying activities. Where this road enters SR-10, the highway is an uphill grade heading north. The alternate junction (Alternative C) of the proposed Quitchupah Creek road diverges from the existing dirt road alignment for the final two miles on the eastern end to avoid the uphill grade on SR-10 by intersecting it north of the crest of the hill.

The Water Hollow alternate alignment (Alternative D) involves leaving the existing Quitchupah Creek Road two miles east of its western end, crossing Water Hollow drainage and climbing up, then crossing the Water Hollow Benches and Saleratus Benches. The road alignment then turns north and east to intersect SR-10. Unlike the other two Alternatives, the majority of the Water Hollow road alignment does not follow an existing road or trail.

Currently, the traffic from the mine travels southwest on the Acord Lakes Road to I-70. The coal trucks going west travel I-70 to Salina and then north on Highways 89 and 28 to the railroad loadout near Levan, while the coal trucks heading east take I-70 to Fremont Junction and then turn north on SR-10 to the Hunter Power Plant near Castledale or the Savage Coal Terminal (SCT) loadout near Price. SR-10 is a north-south highway that connects the central Utah area on the eastern side of the Wasatch Plateau. This two-lane paved highway extends from Fremont Junction on I-70 north to Price. About four miles south of Price, coal trucks traveling to SCT turn east on SR-1306, Ridge Road.

**STATE ROUTE 10**
SR-10 is a north-south highway that connects Fremont Junction on I-70 with Price, Utah. It is an asphaltic concrete, generally two-lane highway that varies greatly in use depending upon the locality. It passes through the towns of Emery, Clawson, Ferron, Castle Dale, and Huntington. It is the primary road of interest since all Alternatives would lead to this road.

SR-10 is an older road built on moisture sensitive soils, the most notorious of which are soils derived from Mancos shales. The road follows the ups and downs of the terrain. There was not a lot of earthwork to eliminate the hills and valleys when this road was built more than 40 years ago. Hence the roadway is susceptible to expansion that may occur within the native soils. Between I-70 and Emery Town the pavement structure is a mix of strengths. Some areas are rated as strong, others as medium, and between milepost 9 and 11 as weak. Under existing traffic, the years to fatigue average nine with four years being worst case.

According to Utah Department of Transportation (UDOT) records, the southern 10-mile section of SR-10 has been repaved and a bridge north of Emery is being replaced. A statewide ongoing construction report listed a 4-inch pavement overlay on 10 miles of SR-10, from milepost 0 (Fremont Junction, at I-70) to milepost 10 (Quitchupah Hill), and was planned for completion by October 2004 (Project # STP-0010(20)0/70418; UDOT 2004a). A chip seal coat was planned over this improved section in spring 2005. According to a September 2005 UDOT Status of Road Construction schedule, 100 percent of this project had been completed (UDOT 2005a). The replacement of Muddy Creek bridge north of Emery began in early summer 2005 (Project # BRF-0010(27)16; UDOT 2005a) and is 95 percent complete. Additional segments of SR-10 are scheduled to be repaved in 2008 (UDOT 2005b).

Two other county roads, newly constructed or scheduled for construction, that would affect traffic patterns on SR-10 are the South Moore Cut-off Road and the CONSOL Road in Emery County. The South Moore Cut-off Road, once completed, will be a shortcut for traffic from I-70 to the east to intersect with SR-10 at Moore and avoid travel on SR-10 between Moore and Fremont Junction 15 miles to the south. The road is being constructed in phases and is not expected to be completely paved for several years. The CONSOL Road serves the CONSOL Mine, which began operation in October 2002, for coal transport. The road intersects the east side of SR-10 at Quitchupah Creek; currently all of the CONSOL Mine coal is hauled north from this intersection.

**Traffic Volumes on SR-10**

The UDOT collects Average Annual Daily Traffic (AADT) information at various points throughout the State. The AADT is defined as the total volume passing a point or segment of a highway facility, in both directions, for one year, divided by the number of days in the year. There are no AADT data for the existing Acord Lakes Road, Quitchupah Creek Road, or Ridge Road. However, the Acord Lakes Road does experience periodic congestion, which has about 50 trucks per hour at peak times (Sorensen, 1999). The current volumes for all vehicular traffic for SR-10 are presented in **Table 3.14-1** and include the present SUFCO Mine related traffic (Christensen, 1999). Predicted AADT for 2020 includes any additional traffic as a result of future coal transport on SR-10.

**Table 3.14-1 SR-10 Highway Traffic Volumes**

| From Interchange/ Junction | To Interchange/ Junction | AADT 2002 | AADT 2003 | AADT 2004 – % Trucks[1] | AADT 2020 - % Trucks @ Max. Haul[2] |
|---|---|---|---|---|---|
| Sevier Emery County Line | West Emery | 520 | 515 | 1,230- 70 | 1,507 - 67 |
| West Emery | East Emery | 1,605 | 1,580 | 1,655 – 32 | 2,107 - 49 |
| East Emery | South Ferron | 1,980 | 1,650 | 1,725 – 25 | 4,007 - 24 |
| South Ferron | North Ferron | 3,760 | 3,695 | 3,860 – 26 | 8,507 - 12 |

| From Interchange/ Junction | To Interchange/ Junction | AADT 2002 | AADT 2003 | AADT 2004 – % Trucks[1] | AADT 2020 - % Trucks @ Max. Haul[2] |
|---|---|---|---|---|---|
| North Ferron | Clawson | 3,080 | 3,030 | 3,170 – 21 | 7,407 - 22 |
| Clawson | Junction SR-57 | 4,389 | 4,315 | 4,510 -16 | |
| South Castle Dale | North Castle Dale | 7,560 | 4,845 | 5,065 – 16 | 7,400 - 07 |
| North Castle Dale | Junction SR-29 | 5,505 | 5,410 | 6,420 – 14 | 6,500 - 12 |
| Junction SR-155 | Junction SR-1306 Ridge Road | 9,973 | 5,005 | 5,035 - 23 | 12,700 - 11 |

Source: UDOT
1. Truck is defined as combination unit truck
2. Maximum haul would be 4.5 million tons annually to Hunter Power Generating Plant at SR-57.

The current volumes of traffic, pavement conditions, safety, and traffic service levels include the coal transport, workers commuting to the mine, vendors providing equipment and supplies to the mine, and the general public on SR-10. The CONSOL Mine contributes 100 to 120 trucks per day five days a week to traffic on SR-10. According to the 2004 UDOT Highway Traffic Book, 32 percent of traffic on SR-10 between the Sevier-Emery County line north to Emery is combination unit truck traffic with a total truck traffic (single and combination units) of 42 percent. Between Clawson and the junction with SR-57, the truck traffic is 16 percent combination unit with a total truck traffic of 22 percent.

**Bridges on SR-10**

There are 14 bridges crossing SR-10 between Fremont Junction and Price. Of the 14 bridges, 11 are in good shape; two are rated as deficient; one (Muddy Creek) is currently being replaced. The two that need replacing are located at Rock Canyon Wash (Reference Post 32.16), and Poulsen Wash (Reference Post 33.04).

**Acord Lakes Road**

At the present time, all vehicles accessing the SUFCO Mine use the Acord Lakes Road, a county road that extends from I-70 past a mountain homes development to the SUFCO Mine, a distance of about 11.1 miles. This road is classified as a rural collector road in the State collector system. It was upgraded by the SUFCO Mine in 1977 from a dirt USFS road to 28 feet wide with an asphaltic concrete surface, designed for a traffic speed of 40 miles per hour. The road section consists of 17.5 inches of untreated base course overlaid by 2.5 inches of gravel sub-base. The asphaltic concrete surface consists of a 3-inch base course overlaid by a 4.5-inch thick surface course. At least one surface seal coat with 0.75-inch chips provides a wear surface. No acid or toxic materials were used in the road surfacing (Duncan, 1982). The Acord Lakes Road is maintained by the SUFCO Mine in cooperation with Sevier County SSD and UDOT. SUFCO repairs the road surface, blades the adjacent drainage ditches, fills potholes, and resurfaces the road. SUFCO spends approximately $139,000 per year maintaining the Acord Lakes Road. The road is maintained consistent with a USFS Level 4 maintenance program (USDA-USFS, 1992). Drainage along the road is controlled by roadside drainage channels and culverts. The culverts were constructed in accordance with manufacturer recommendations. These culverts have sustained soil pressures, vehicular loads, and drainage flows. No significant structural problems have been observed with the culverts.

Traffic from the Acord Lakes Road must proceed either east or west on I-70. The majority of coal trucks head west to Salina and the Levan loadout. However, in the past as much as one million tons a year of the coal from the SUFCO Mine has been transported east to Fremont Junction and then north on SR-10 to railroad loadouts near Price. In 2002, an additional 2.5 mmtpy were transported on this route between the SUFCO Mine and Pacificorp's Hunter Power Plant.

For loaded coal trucks, the route on Acord Lakes Road southwest to I-70 is generally down-gradient; then the route east on I-70 crosses the Emigrant Pass summit at 8,030 feet elevation, a climb of 1,300 feet in 7.5 miles. After Emigrant Pass, the route east on I-70 to Fremont Junction is down-gradient and the route north on SR-10 is level with short steep grades over hills. The ascent of the Emigrant Pass summit on I-70 can be difficult in the winter during inclement weather and periodically the road is closed by heavy snows or ice on the road surface.

**Ridge Road**

Ridge Road, SR-1306, is classified as a "rural major collector" that was completed in 1989 to bypass Price for traffic eastbound to Wellington and US-6. It is 7.3 miles long and has 12-foot wide lanes in each direction, 4-foot shoulders, 5.5 inches of bituminous surface course, and 6 inches of untreated base course. There is some confusion by the regulatory agencies about whether Carbon County or the State owns the road; however, UDOT performs the maintenance on it. It is used for coal transport only for the first couple of miles to access the SCT coal loadout but continues on to terminate at the east side of Wellington at US-6.

## Potential Impacts To Transportation

**REGULATORY**

The proposed transportation routes to transport coal and service the SUFCO Mine would be required to meet the regulations from several entities who would be affected or have jurisdictional control. The project would adhere to the Emery County planning process and local ordinance 8-7-85A. The existing Quitchupah Creek Road is covered under an interlocal agreement for maintenance between Emery and Sevier Counties (Funk, 1999), but the agreement would likely be revised if the proposed project were constructed. If the construction corridor were to expand beyond the county-granted easement of 100 feet for Class B roads, then Sevier County would need to file an easement application with SITLA to cover the portion that may be outside the existing easement. With a changed road use, UDOT would require an Encroachment Permit for entrance on to SR-10 (Laws, 1999). In addition, the SR-10 right-of-way width is limited, which may necessitate the acquisition of additional right-of-way width.

**NO ACTION - ALTERNATIVE A**

Existing traffic patterns in the area of interest would remain essentially the same except for the proportional amount attributed to future increased mine production. Essentially the increase in coal truck traffic to the east is dictated by coal contracts to power plants and would continue on the present road system. The Acord Lakes Road would continue to experience periodic congestion when carrying about 50 trucks per hour at peak times.

Coal purchased from SUFCO Mine by Pacificorp for use at the Hunter Power Generating Plant would continue to be transported via the current route. Thus, road wear due to heavy coal trucks would continue on I-70 between the Acord Lakes Road Junction and Fremont Junction, and especially on SR-10.

Beginning in 2002, the minimum amount of coal transported to Emery County destinations was two million tons annually. That was the minimum amount that Pacificorp had contracted to purchase for use in the Hunter Power Plant near Castle Dale, Utah. The maximum amount that Pacificorp will purchase

from the SUFCO Mine is 4.5 mmtpy. In 2004, Hunter purchased 4.2 mm short tons of Utah coal, mostly from SUFCO. This contract will be filled whether or not the proposed project is approved. The one million tons hauled to railroad loadouts in Carbon County is dependent upon railroad price structures. Estimated increases in AADT on SR-10 from coal truck traffic range from 372 to 1024, depending on the amount of coal trucked to the Hunter Power Plant and the Carbon County railroad loadouts. This is an increase in the range of 8 to 23 percent over the current AADT on SR-10 between Ferron and SR-57, and an increase in the range of 70 to 170 percent over the current AADT on SR-10 south of Emery (**Table 3.14-1**). When compared to the AADT predicted for 2020, the range of increase is 8 to 14 percent on SR-10 at Castledale, and 70 to 128 percent on SR-10 at Emery.

The existing roads on Forest and public lands would continue to be the road system for Convulsion and Quitchupah Creek. This would adequately serve the livestock operators and few recreationists in the Project Area according to the Convulsion Canyon Road Analysis (USFS, 2002).

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**

The primary impact of the Quitchupah Creek Road on transportation would be the reduction of coal truck traffic on I-70 between the Acord Lakes Road junction and Fremont Junction and on eight miles of SR-10 south of the Quitchupah Creek Road. Additionally, where the current Quitchupah Creek Road intersects SR-10, major modifications, in the form of turn lanes, to the highway and bridge would be necessary to allow all traffic to converge safely. Slow moving trucks that enter the highway must be avoided by oncoming traffic and allowed to gain highway speed before merging into the traffic flow.

Because of the northbound uphill grade on SR-10 north of the proposed junction, loaded coal trucks would need a long acceleration lane to prevent traffic delays. At Quitchupah Hill, a passing lane on the northbound uphill grade is presently needed to accommodate the coal truck traffic and would also be required for the proposed Quitchupah Creek Road.

The proposed road would junction with SR-10 at the existing intersection with the CONSOL Mine Road, an Emery County road 4.5 miles south of the Town of Emery. Because the proposed road and the CONSOL Mine Road would both carry coal truck traffic, both right and left turn lanes would be required for each road. Also, due to the uphill grade for northbound traffic an extended acceleration and climbing lane of 2,300 feet would be required for the coal truck traffic (**Figure 2.3**). Thus, there would be 4 lanes south of the intersection and 5 lanes north of the intersection. The existing bridge over Quitchupah Creek would need to be widened 8 feet to the west and 32 feet to the east, almost doubling its current width.

It is unlikely that the junction between the proposed road and SR-10 would cause traffic flow interruptions. The addition of turn lanes and an acceleration lane would keep the coal trucks from pulling into moving traffic and give enough distance to pick up speed before moving into the through-lanes. Traffic exiting SR-10 would also utilize the turn lanes, thereby avoiding traffic interruption. These elements would provide safety and smooth traffic flow. The disturbance for construction of the intersections and additional lanes would occur within the UDOT right-of-way or acquired right-of-way.

The route in Convulsion Canyon and Quitchupah Creek is all downgradient for loaded coal trucks, dropping 1600 feet in elevation. This route would allow loaded coal trucks to avoid the ascent of the Emigrant Pass summit on I-70.

Pacificorp currently purchases coal from the SUFCO Mine for the Hunter Power Generating Plant. Building the Quitchupah Creek Road would shorten the one-way transportation distance from the SUFCO Mine to destinations in Emery and Carbon Counties by an average of 55.4 miles round-trip, lowering the cost of coal delivery (See **Section 3.15**, Socioeconomics). The Quitchupah Creek Road would remove coal trucks from I-70 between the Acord Lakes Road Junction and Fremont Junction and from SR-10 south of the junction with the Quitchupah Creek Road. Wear on these sections of road would decrease as compared to the No Action Alternative.

The construction of Quitchupah Creek Road would alleviate coal truck traffic on 17 miles of I-70 between Acord Lakes Road Junction and Fremont Junction and the 8.4 mile section of SR-10 between I-70 and the intersection with the Proposed Road. This would lessen wear and surface cracking on that portion of road, decreasing repairs and maintenance costs. The proposed Quitchupah Creek Road would lessen the round-trip haul by about 55.4 miles.

**ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C**

This Alternative is identical to the above except for the final (easternmost) two miles. This route diverges from the proposed route near the west boundary of Section 13, Township 22 South, Range 5 East and proceeds generally east across that section on public lands, continuing through Section 18 on private lands, Township 22 South, Range 6 East, to intersect SR-10 in the southwest corner of Section 17, Township 22 South, Range 6 East. Where the loaded trucks would enter SR-10, the grade for northbound traffic is only 0.07 percent. Significantly fewer modifications to SR-10 would be needed for this alternative. This junction with SR-10 allows loaded coal trucks to avoid the steep grades on Quitchupah Hill.

The proposed road would junction with SR-10 approximately 3.0 miles south of the Town of Emery creating a new intersection. Because the proposed road would carry coal truck traffic, both right and left turn lanes would be required for the proposed road. Thus, there would be 3 lanes south of the intersection and 4 lanes north of the intersection. Since there is little grade for northbound traffic, an acceleration lane of only 1,380 feet would be required for the coal truck traffic (**Figure 2.7**).

It is unlikely that the junction between the proposed road and SR-10 would cause traffic flow interruptions. The addition of turn lanes and an acceleration lane would keep the coal trucks from pulling into moving traffic and give enough distance to pick up speed before moving into the through-lanes. Traffic exiting SR-10 would also utilize the turn lanes, thereby avoiding traffic interruption. These elements would provide safety as well as ensure smooth traffic flow. The disturbance for construction of the intersection and additional lanes would occur within the UDOT right-of-way or acquired right-of-way.

The route in Convulsion Canyon and Quitchupah Creek is all downgradient for loaded coal trucks, dropping 1600 feet in elevation. This route would allow loaded coal trucks to avoid the ascent of the Emigrant Pass summit on I-70.

The number of trucks transporting coal from the SUFCO Mine through Emery and Carbon Counties would be the same as under Alternatives A and B. Therefore, the estimated AADT on SR-10 as a result of coal truck traffic would be the same as Alternative B.

The Quitchupah Creek Road with an Alternative Junction would shorten the round-trip distance from the SUFCO Mine to Emery and Carbon County destinations by about 58 miles. As with Alternative B, coal truck traffic would be removed from I-70 for 17 miles between the Acord Lakes Road Junction and Fremont Junction and then about 10 miles on SR 10 between Fremont Junction and the proposed

Quitchupah Creek Road with Alternative Junction. Wear on these sections of road due to coal truck traffic would decrease.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**

Under Alternative D, the number of trucks transporting coal from the SUFCO Mine through Emery and Carbon Counties would be the same as under Alternatives A, B, and C. Therefore, the estimated AADT on SR-10 as a result of coal truck traffic would be the same as Alternative B.

The proposed road would junction with SR-10 approximately 6.5 miles south of Emery Town and 2.0 miles south of Quitchupah Creek Bridge creating a new intersection. Because the proposed road would carry coal truck traffic, both right and left turn lanes would be required for the proposed road. Thus, there would be 3 lanes south of the intersection and 4 lanes north of the intersection. Since there is little grade for northbound traffic, an acceleration lane of only 1,380 feet would be required for the coal truck traffic (**Figure 2-11**).

It is unlikely that the junction between the proposed road and SR-10 would cause traffic flow interruptions. The addition of turn lanes and an acceleration lane would keep the coal trucks from pulling into moving traffic and give enough distance to pick up speed before moving into the through-lanes. Traffic exiting SR-10 would also utilize the turn lanes, thereby avoiding traffic interruption. These elements would provide safety as well as ensure smooth traffic flow. The disturbance for construction of the intersection and additional lanes would occur within the UDOT right-of-way or acquired right-of-way.

The Water Hollow Alternative route is mostly downgradient for loaded coal trucks, dropping 1,600 feet in elevation; however, crossing Water Hollow drainage would require loaded coal trucks to ascend a 5-7 percent grade for about 1,200 feet. This ascent would slow loaded coal trucks traveling across the Water Hollow Bench.

This route also would allow loaded coal trucks to avoid the ascent of the Emigrant Pass summit on I-70.

The Water Hollow Road would reduce the round-trip distance from the SUFCO Mine to Emery and Carbon County destinations by 46 miles. As with Alternatives B and C, coal truck traffic would be removed from I-70 for 17 miles between the Acord Lakes Road Junction and Fremont Junction, and removed from SR-10 for six miles from Fremont Junction north to two miles south of Quitchupah Creek. Wear on these sections of road due to coal truck traffic would decrease.

**MITIGATION AND MONITORING FOR BUILD ALTERNATIVES**

All new roads across Federal, State, or local lands would be constructed to AASHTO, UDOT, or agency standards. The drainage control system would be monitored for at least three years to insure proper function and implement any repairs or design changes necessary for long term stability (see Quitchupah Creek Road Monitoring Plan, Alternative D). Also, there would be conditions in the right-of-way document that would require SSD to perform maintenance and repairs to keep the road in compliance with the Highway Safety Act.

**IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS**

Under any of the build alternatives, a public roadway would be constructed dedicating 45-55 acres of land to roadway. Under Alternatives B or C, the current dirt/two-track roadway along Quitchupah Creek would no longer be available. Coal trucks would utilize the roadway to travel to eastern loadouts rather than other roadways. The public could also use this roadway for access. The proposed road would be a rural collector road in the State road system joining Acord Lakes Road with SR-10.

**CUMULATIVE EFFECTS**
Because coal mining and related activities have been occurring in the region for several decades, many access roads are evident within the surrounding area. Users, ranchers, recreationists, miners, and others have and may continue to create unauthorized roads. Some roads may become deteriorated or impassable through inactivity. The new public roads in the area include the South Moore Cut-off Road which may reduce traffic from 50 to 200 AADT on SR-10 due to the shortcut east to I-70. Another new road is the realignment of the CONSOL Mine Road which carries coal truck traffic from CONSOL Mine to markets north on SR-10. This additional coal truck traffic joins with the existing coal truck traffic northbound on SR-10 near the Quitchupah Creek bridge.

The cumulative effect would be that additional acreage (45-55 acres) would be dedicated to roadway. Additional maintenance of roads would be required in the Proposed Action area and the possibility of increased traffic accidents and delays may result.

The duration of effects (e.g., increased traffic volume, increased potential for accidents, increased traffic delays, and road degradation) resulting from past, present, and reasonably foreseeable actions combined with the Proposed Action or any Action Alternative would peak for the length of time coal is transported (20+ years), but continue for as long as the rural collector road is in service.

## 3.15 Social and Economic Resources

The socioeconomic Study Area surrounding the proposed Quitchupah Creek Road consists of Carbon, Emery, and Sevier Counties in central Utah. Carbon and Emery Counties are closely tied economically, while Sevier County's economy is more removed from the economy of the other two counties. This section describes relevant socioeconomic elements of the Study Area and sets the stage for the socioeconomic impact analysis.

**Quitchupah Creek Area**
This area is characterized as a quiet, undeveloped steep canyon area lying east of the SUFCO mine, opening to SR-10 in Emery County. The area around the upper reaches of the creek is administered by the Forest Service and the BLM; the lower area is privately owned. The Quitchupah Creek area currently has an unimproved two track road throughout its length. At the present time the primary socioeconomic uses of the Quitchupah Creek area are public (Forest Service and BLM) and private grazing, dispersed recreation (including hunting and sightseeing), and irrigated pasture activity in the lower reaches. ATV activity occurs in the canyon although this area is not currently regulated as an official ATV use area by either the Forest Service or BLM.

**Utah Coal Industry**
The 13 Utah underground coal mines combined produced 19.7 million metric tons (mt) (21.7 million short tons (st)) of coal in 2004, 6.5 % less than in 2003 (Utah Energy Office 2004). All of the mines and facilities are located in east-central Utah. The underground mines in the Wasatch and Book Cliffs coal fields, located mostly in Carbon and Emery Counties, produce almost all of the coal which is marketed throughout the west. The largest coal producer in 2004 was the SUFCO Mine, which produced a near-record high of 6.87 million mt.

The Utah coal mining industry has a direct, significant impact on local economies where mining occurs. In 2004, mining companies respectively employed 706, 701, and 399 persons in Carbon, Emery, and Sevier Counties (OSM 2005). In Sevier County, Canyon Fuel Company was the third largest employer.

According to the 2004 Summary of Mineral Activity in Utah (Bon and Krahulec, 2004): "Over half of Utah's coal was consumed in-state by three electric utilities in 2004. Coal was also used for industrial purposes within the state and shipped to electric utilities and industrial users in other states. The export market to Pacific Rim countries, which had accounted for up to 5.0 million mt of production in 1996, dwindled to less than 0.45 million mt in 2002, and to none in 2003 and 2004, mainly due to foreign competition. No overseas coal exports are anticipated in the next several years."

**Federal Coal Royalty Payments in the Study Area**

Mining companies extracting coal from Federal coal deposits pay a royalty to the Federal government (**Table 3.15-1**). The coal mining companies in Utah pay approximately $33 million annually in royalties. In 1999, coal royalties represented 53 percent of Federal mineral lease payments in Utah. Fifty percent of Federal mineral lease payments are returned to the state of origin. States have full discretion as to distribution of mineral lease payments, as long as priority is given to areas with social and/or economic impacts as a result of mineral lease activity.

**Table 3.15-1 Utah Coal Production and Royalties on Federal Lands**

| Description | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|
| **Carbon County, Utah** | | | | |
| Sales Volume (tons) | 2,890,078 | 4,735,288 | 5,016,679 | 3,084,196 |
| Royalties ($) | 8,958,849 | 6,069,579 | 6,177,243 | 4,211,025 |
| Disbursed to State ($) | 4,479,425 | 3,034,789 | 3,088,621 | 2,105,513 |
| **Emery County, Utah** | | | | |
| Sales Volume (tons) | 6,225,733 | 14,223,543 | 11,672,643 | 10,522,326 |
| Royalties ($) | 17,603,597 | 19,011,504 | 14,199,103 | 12,876,284 |
| Disbursed to State ($) | 8,801,799 | 9,505,752 | 7,099,551 | 6,438,142 |
| **Sevier County, Utah** | | | | |
| Sales Volume (tons) | 2,566,422 | 6,014,967 | 5,632,331 | 7,268,525 |
| Royalties ($) | 7,356,402 | 8,407,485 | 9,314,751 | 12,238,148 |
| Disbursed to State ($) | 3,678,201 | 4,203,742 | 4,657,375 | 6,119,074 |

Source: Federal Mineral Revenue Disbursements by State and County, Minerals Management Service, Fiscal Years as indicated.

**SUFCO Mine**

Coal production at the SUFCO Mine was 7.1 million tons in 2003, 27 percent of the total coal production in Utah. In 2004, SUFCO was the largest coal producer in Utah, with a near-record high of 6.87 million mt. SUFCO Mine intends to increase annual production at the SUFCO Mine to a maximum of 8.5 million tons, market conditions allowing. The SUFCO Mine is an industry leader in efficiency, producing coal at the rate of nearly 100 tons per man-shift compared to the industry average of 55 tons per man shift (SUFCO Mine Information and Data Book, 2001 Coal Report). The efficiency of production helps offset the high transport costs due to the distance from loadouts and consumers, and has kept the SUFCO Mine competitive with the other major coal mines in Carbon and Emery Counties.

At an average annual production of 26 million tons the Utah coal industry has revenues of $450 million plus. The revenues at the SUFCO Mine, based on 7.1 million tons, in 2002 were about $124 million. The recently acquired Muddy tract is expected to increase SUFCO Mine life by 11 years at the current production rate (Utah Energy Office, 2004).

The SUFCO Mine relies on truck transport for all of its coal shipments because it is located far from railheads and loadouts. Coal is either transported west 82 miles to the Levan Loadout or east 62 miles to Hunter Power Plant or east 83 miles to the Savage Loadout. To overcome the disadvantage of distance the SUFCO Mine operates very efficiently, to produce high BTU, low sulfur coal needed by the electrical power producing plants to derive the greatest amount of power per ton of coal yet satisfy the requirements of air quality permits.

To comprehend the burden of truck transport of coal, the SUFCO Mine and Sevier County are investing a lot of effort planning and permitting a railroad from Levan to Salina to reduce the westward coal truck transport distance by about 53 miles.

**SUFCO Mine Employment**

The SUFCO Mine is located in Sevier County ten miles west of Emery. Mine employment in 2002 was 290. That employee count, by county of residence, is shown in **Table 3.15-2** for the years 1999 through 2002. Mine employment in 2003 was 281.

**Table 3.15-2 SUFCO Mine Employment by County of Residence**

| County | End of Year 1999 | | End of Year 2000 | | End of Year 2001 | | End of Year 2002 | |
|---|---|---|---|---|---|---|---|---|
| | Number | Proportion | Number | Proportion | Number | Proportion | Number | Proportion |
| Sevier | 158 | 67.5% | 163 | 64.7% | 163 | 59.1% | 164 | 56.5% |
| Sanpete | 68 | 29.1% | 72 | 28.6% | 72 | 26.1% | 84 | 29.0% |
| Emery | 0 | 0.0% | 8 | 3.2% | 27 | 9.8% | 27 | 9.3% |
| Juab | 7 | 3.0% | 7 | 2.8% | 7 | 2.5% | 8 | 2.7% |
| Carbon | 0 | 0.0% | 0 | 0.0% | 4 | 1.4% | 5 | 1.7% |
| Millard | 1 | 0.4% | 1 | 0.4% | 1 | 0.4% | 1 | 0.3% |
| Uintah | 0 | 0.0% | 0 | 0.0% | 1 | 0.4% | 0 | 0.0% |
| Wayne | 0 | 0.0% | 1 | 0.4% | 1 | 0.4% | 1 | 0.3% |
| Totals | 234 | | 252 | | 276 | | 290 | |

Source: SUFCO Coal Mine (April, 2003)

As this table shows, employment in Sevier County held fairly steady during the period 1998-2002 while, at the same time, total employment increased. This led to a drop in the proportion of mine employees residing in Sevier County. However, during this same time period the number of employees residing in Emery County increased from 0 to 27. This raised Emery County from one of the three lowest counties to the third highest in terms of SUFCO mine employment. Employment at the SUFCO Mine in both Carbon and Sanpete Counties increased in 2002.

SUFCO Mine is the largest single coal producer in Utah, and supplies coal to major power plants in Utah, Nevada, California, and Midwest. Other markets include cement, lime, and gypsum plants, other

industrial users, governmental, and residential users in the West. As stated previously, SUFCO Mine is an industry leader in efficiency, producing coal at the rate of nearly 100 tons per man-shift compared to the industry average in Utah of 50 tons per man-shift (SUFCO Mine Information and Data Book). The coal itself is unique and valued because of its low ash and sulfur content; this coal is utilized by electrical power generating plants in a mix with lower quality coal to reduce emissions of environmentally hazardous materials and maintain compliance with air quality permit requirements.

The SUFCO Mine as a coal mine has a "direct effect employment multiplier" of 5.5 (Utah State and Local Government Fiscal Impact Model working Paper Series: 2001-1 Multipliers for Utah; Prepared by: Governor's Office of Planning and Budget Demographic and Economic Analysis Section). This means the SUFCO Mine employment alone contributes some 1,600 jobs (290 x 5.5, which includes the jobs at the mine). For every person employed at SUFCO Mine, 4.5 additional jobs (1,273 jobs) are created. Many of the additional workers (about 204) are employed to transport the coal to end users.

The SUFCO Mine will most likely expand to the 8.0 to 8.5 million tons per year level over the next 10 years; at that production level, employment is expected to increase to about 310 employees (Wes Sorensen, SUFCO mine).

Since the Hunter Power Plant is a major market for the SUFCO Mine, competition from other mines nearer to the plant could adversely affect the market for coal mined at the SUFCO Mine. The coal production in Utah is steady because there is a limited regional market that determines the level of production. To enter this market, a new mine or increased production from an existing mine must replace an existing producer. Within 20-30 miles of the Hunter and Huntington power plants, there is one new mine and two large coal reserves scheduled for development and production. If these new mines were to match the efficiency of the SUFCO Mine, they would have a competitive advantage based on transport costs. The savings on transport costs for a mine at 30 miles one-way distance over the current SUFCO transport of 62 miles one-way would be $2.24 per ton or about 13 percent of market value which was $17.54 per ton in 2001; for a mine at 20 miles one-way distance the savings would be $2.94 per ton or 17 percent of market value.

In comparison, the SUFCO Mine transport cost of $1.85 per ton due to the shorter distance on the Quitchupah Creek Road would reduce the transport cost differential to $0.39 per ton for 30 miles and $1.09 for 20 miles. This would allow the SUFCO Mine to remain competitive with the newer mines and maintain its share of the market. According to statements made at the Utah Coal Conference in 2001 the market for Utah coal in the future is a "well defined market with marginal growth".

**Land Ownership**

The counties of Sevier, Carbon, and Emery are contiguous, with Carbon County being immediately north of Emery County, and Sevier County being immediately west of the southern half of Emery County. None of the counties are considered part of a Metropolitan Statistical Area. Government is a significant landowner in each of the three counties (**Table 3.15-3**).

**Table 3.15-3 Land Ownership**

| Description | Carbon County, UT | Emery County, UT | Sevier County, UT |
|---|---|---|---|
| Acres | 947,632 | 2,850,356 | 1,222,107 |
| Federal | 47.5% | 79.8% | 76.0% |
| State | 13.1% | 11.8% | 4.9% |
| Private/Local Government | 39.4% | 8.4% | 19.1% |

Source: Federal Land Payments in Utah, Governor's Office of Planning and Budget

**Population**

Sevier County is the most populous of the three counties, with a 2004 estimated population of 19,415, followed by Carbon County with an estimated 2004 population of 19,385. Emery County had a 2004 estimated population of 10,493. Over the past twenty years, the populations of Carbon and Emery Counties have decreased slightly while Sevier County's population has grown by 1.4 percent annually.

Population projections through the year 2030 indicate an expected average increase of 0.8 percent per year in the three counties (**Table 3.15-4**). The three communities on the transport route from the SUFCO Mine to the Hunter Power Plant (Clawson, Emery, and Ferron) are projected to have a combined average annual increase in population of 0.7 percent between now and 2030. Castle Dale, Clawson, Emery, Ferron, Huntington, Price, and the other municipalities directly impacted by the transport of coal from the SUFCO Mine to railroad loadouts near Price, are projected to collectively increase in population by 0.7 percent annually until 2030.

**Table 3.15-4 Population Projections**

| | 2005 | 2010 | 2020 | 2030 |
|---|---|---|---|---|
| Castle Dale City | 1,753 | 1,829 | 2,005 | 2,113 |
| Clawson Town | 164 | 171 | 187 | 197 |
| Emery Town | 299 | 312 | 342 | 360 |
| Ferron City | 1,669 | 1,742 | 1,910 | 2,012 |
| Huntington City | 2,014 | 2,102 | 2,304 | 2,428 |
| Price City | 9,670 | 10,151 | 10,842 | 11,481 |
| Carbon County | 22,951 | 24,091 | 25,732 | 27,248 |
| Emery County | 10,772 | 11,243 | 12,322 | 12,984 |
| Sevier County | 20,635 | 22,155 | 24,598 | 26,498 |
| Tri-County Area (Carbon/Emery/Sevier) | 54,358 | 57,489 | 62,652 | 66,730 |

Source: Governor's Office of Planning and Budget

**Study Area Employment and Income**

Approximately 11.1 percent of the total nonagricultural employment (1,842 jobs) in the tri-county area is due to mining according to 2001/2002 detailed data (Utah Department of Workforce Services, 1999). Trade, transportation, and utilities accounted for 25.9% of the total nonagricultural employment (5,067 jobs) and government accounted for 24.7% (4860 jobs). Mining accounted for 19.2 percent of total nonagricultural wages in the three counties in 2002, while trade transportation and utilities accounted for 28.7% and government employment accounted for 22.8%. Each of these three industries pays higher than average wages.

Unemployment in Carbon and Emery Counties tends to be higher than that in Sevier County. From 1990-2003, unemployment in Carbon County was in the range of 5.9 percent to 7.8 percent, while unemployment in Emery County was between 6.5 percent and 11 percent. Unemployment in Sevier County declined from 4.8 percent in 1994 to 3.9 percent in 2000, and then rose to 5.4 percent in 2003.

Nonagricultural employment in Sevier County rose steadily from 4,616 in 1980 to 7,311 in 2002, an average annual increase of 2.2 percent, then dropped off to 7,160 in 2003. Nonagricultural employment in Carbon County rose from 8,523 in 1980 to 8,918 in 2002, then dropped to 8,602 in 2003. In 2003, mining accounted for 8.6 percent of the nonagricultural employment in Carbon County. Nonagricultural employment in Emery County was 4,501 in 1980, and declined to 3,498 in 2003. In 2003, mining was the second largest industrial sector (in terms of employment) with 648 employees or 18.5 percent of total

employment in Emery County. Transportation and public utilities, which includes the Hunter and Huntington Power Plants, were estimated to have approximately 902 employees, 25.8 percent of 2003 total employment in Emery County.

Emery County has the highest average monthly wage of the subject counties. From 1980 to 1998, Emery County's average monthly nonagricultural wage increased at an annual rate of 2.9 percent. The average monthly wage in Carbon County and Sevier County increased at 3.1 percent and 3.2 percent, respectively. From 1998 to 2003, mean rates of increase were smaller, as the average monthly wage in Emery, Carbon, and Sevier County increased at rates of 1.4, 2.2, and 2.8 percent, respectively.

Although Emery County had the highest average monthly wage in 2003 ($2,831 vs. $2,551 for state), Carbon County had the highest per capita personal income of the three counties. Per capita personal income in Carbon County was $23,365 in 2002, as compared to $18,776 in Emery County, and $18,828 in Sevier County. Per capita income for the state in 2002 was an average of $24,639, for the nation it was $30,906.

The three counties vary widely in median household income. Emery County had the highest median household income in 2002 ($40,759), followed by Sevier County ($36,721), and Carbon County ($36,132). Emery County has the smallest number of households in the three lowest income brackets as well as the highest number in the three upper income brackets, according to 2003 federal tax return data.

In one year, 2002, direct wages at SUFCO Mine totaled $32.9 million. The jobs created on the foundation of mine employment added another $30.0 million in wages, for a total of $62.9 million of wages tied to the mine.

**Agriculture**

Agriculture plays a role in the economy of each of the three counties. Sevier County produced over $39 million worth of agricultural products in 1997, while Carbon County produced $3.6 million, and Emery County $11 million. The value of production is dominated by livestock in each of the three counties, with cattle being the product with the highest total value in each of the counties.

**Sevier County**

Sevier County is a mostly rural county in central Utah. Recently Sevier County has been in economic limbo with jobs growing at a rate of 0 to 1.25 percent annually. In 2004, the unemployment rate of 4.9 percent was just above the state average of 4.8 percent and below the national average of 5.5 percent. The population has grown slowly at a rate of 0.3 to 2.2 percent annually, below the state average of 2.4 percent (County Trends December 2004, Sevier).

Among the list of the largest employers in Sevier County, Barney Trucking is #2 and SUFCO Mine is #3 (Utah Department of Workforce Services, 2002). Both of these companies derive their income from the sale and transport of coal.

The SUFCO Mine and dependant trucking companies pay about 28 percent of the property taxes in Sevier County. In 2002, SUFCO Mine purchased $64.6 million in goods and services, much of this from Sevier and Carbon Counties. Sevier County has received over $1.0 million from the Federal coal royalties paid by SUFCO Mine.

**Emery County**
Emery County's economy steadily increased in 2003 and 2004. The increase in nonfarm jobs was 4.7 percent from 2003 to 2004 (Department of Workforce Services). The current unemployment rate is 8.7 percent, while the Utah rate for unemployment is 4.8 percent and the national rate 5.5 percent (County Trends December 2004, Emery).

The mining industry has lost 24 jobs or 3.6 percent of the total employment in mining between 2003 and 2004, as the last figures available. The utilities industries have gained 19 jobs in the same period. The trucking industry lost a few jobs in 2004 (Utah Department of Workforce Services).

**Carbon County**
Carbon County in the last decade had one of the slowest population growth rates of any county in Utah. The county population declined 1.5 percent in 2003. The economy is based on coal mining, utilities, transportation, and government. Coal mining and associated mining services had seen a decline in jobs until 2002, when mining added 180 jobs (County Trends, Dec. 2002), but mining again lost jobs (50) from 2003 to 2004. Carbon County is the center of mining services for the coal industry in Utah, and Joy Technologies, Inc., a mining service company, is named seventh on the list of largest employers in the county (Utah Department of Workforce Services).

According to 2003 figures, the average monthly wage in Carbon County is only 90% of the average wage for Utah, and the county is listed as tenth in the state for average monthly wage. Within Carbon County, mining is the leader in average monthly wage. Unemployment rates in Carbon County have consistently been higher than the state rate (Utah Department of Workforce Services).

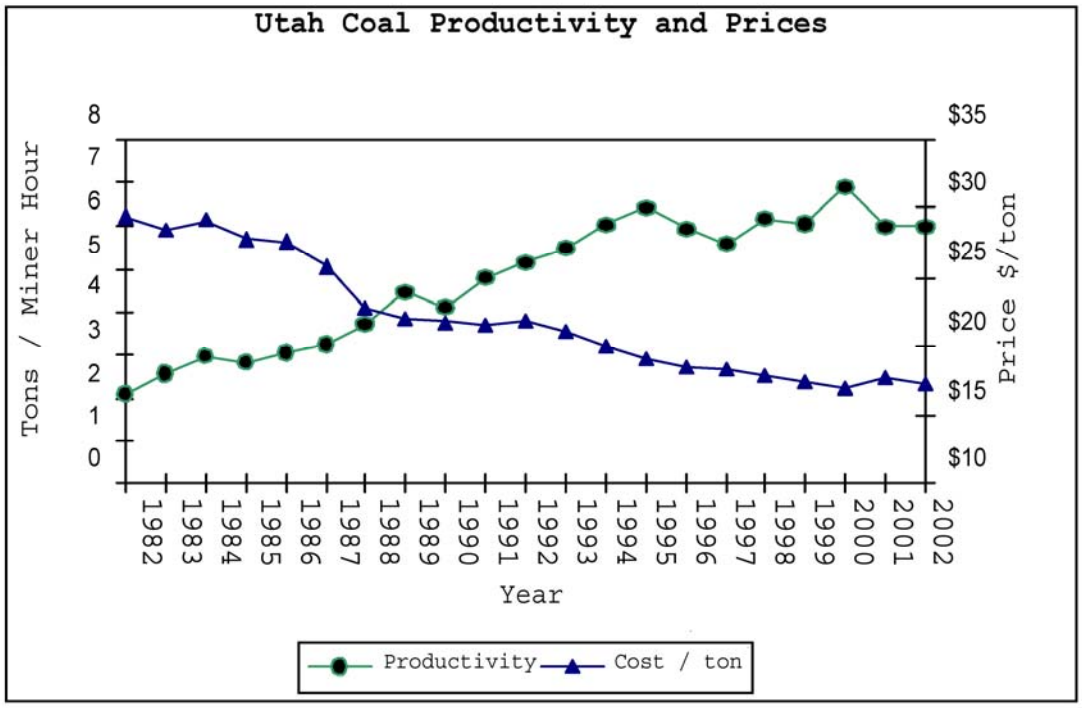
**Transportation Costs**
Region 4 of the UDOT estimates that for normal existing traffic volume on I-70 for the 17 miles between Exit 72 and Exit 89 they spent $500,000 in 2001 for surface seal and $50,000 in 2004 for surface rejuvenation. A major rehabilitation of this section of I-70 is scheduled for 2006 and will cost between $10 and $13 million. I-70, although 28 years old, is in good condition and is expected to be able to handle forecasted increases in traffic volume without additional routine maintenance costs. A typical schedule for this interstate highway includes surface rejuvenation at three year intervals, alternating with surface seal at six year intervals, structural overlays at 15 year intervals, and new pavement structure at 48 years.

Region 4 of UDOT estimates that for normal existing traffic volume on SR-10 from the Fremont Junction (I-70 Exit 79) to south of the town of Emery, they will spend $200,000 for a chip seal coat in 2005 and $20,000 in 2008 for surface rejuvenation under the existing traffic regime. SR-10 is an old narrow road built on poor soil materials, follows the contour of the land in hilly terrain, and has weak to medium strength pavement structure. Under existing traffic the years to fatigue average nine, with four years being the worst-case scenario (Scott Goodwin, Region 4, UDOT, 2001).

## Potential Impacts To Social and Economic Resources

The SUFCO Mine operates in a very competitive energy market. As shown in the graph below, the increase in productivity in Utah coal mining has led to lower coal prices. These lower coal prices have provided for more reasonable electrical energy prices for the public.

Reviewing the financial performance (and stock prices) of coal companies shows the increased productivity has not added significantly to corporate margins or bottom-line profitability. The Skyline Mine, owned by the same parent company as SUFCO, closed temporarily in 2004 due to low prices.




Data from page 2 of the *2001 Annual Review and Forecast of UTAH COAL Production and Distribution, January 2003*, by the Utah Geological Survey and Utah Energy Office of the Department of Natural Resources (2002 projected).

Similar results would be expected for the Quitchupah Creek Road Project coal transportation cost savings. Although there would be some initial increased profitability for the mining company, the competitive nature of the market should again ensure that the added profit margin would be reduced to historic or prevailing levels. The fuel savings would then pass to the generating station and historically then to the consuming public due to the regulated or open market nature of electrical power generation.

In addition, the decreased transportation cost would allow the SUFCO Mine to recover more of the coal resource and increase the overall recovery. SUFCO Mine personnel have projected up to 11 million additional tons of coal could be recovered if the Quitchupah Creek Road were built, adding some 1.3 years to the life of the mine. These 11 million tons could provide for the electrical needs of some 1.7 million average residential customers for the 1.3 years. This is an energy resource that would otherwise be lost because it would be uneconomic to recover.

Production levels that are predetermined by in-place contracts are expected to occur under the No Action alternative (Alternative A) as well as with the build alternatives (Alternatives B, C, D). Consequently, employment and payroll at the SUFCO mine would not change as a direct result of any of the alternatives. However, employment and payroll could change in the future to accommodate production fluctuations associated with the Pacificorp contract and to accommodate any additional SUFCO contracts that are either signed or canceled. It is expected that SUFCO employment would increase from the current level of 290 to approximately 310 over the next several years once the mine reaches its maximum production of 8.5 million tons per year.

There would be no differences attributable to any of the alternatives in terms of the Study Area's:

- population growth estimates,
- land ownership (Federal, state, private),
- agricultural production,
- Federal coal royalty payments to counties.

Additionally, there will be an increase in noise, truck traffic, and probability of accidents through the communities of Emery, Ferron, Huntington, Clawson, and Castle Dale on SR-10 due to the delivery of coal to Hunter Power Plant.

The value of the Quitchupah Creek Road to the SUFCO Mine is measured in the reduction in trip costs and the reduced effort to transport coal. The round trip from the SUFCO Mine to the Hunter Generating Power Plant would be reduced by an average of about 50 miles (43 percent), depending on the build alternative. The cost to transport one ton of coal on the round trip to Hunter was 25 percent of the market value of the one ton of coal in 2001. The 43 percent reduction in mileage would save 11 percent of the market value of a ton of coal, thus potentially increasing profits. The 11 percent savings for an annual transport of 4.1 mmtpy means a considerable cost advantage for the coal producer, allowing the SUFCO Mine to remain competitive in the coal markets to the East.

The segment of I-70 on which SUFCO coal trucks now transport to the east is structurally sound and capable of handling expected increases in truck traffic without any additional maintenance costs. Therefore, there are no differences expected in I-70 maintenance costs regardless of whether SUFCO trucks operate on this segment of the highway (i.e. No Action alternative) or not (i.e. Alternatives B, C, D) (Scott Goodwin, UDOT, Region 4, 2001).

SR-10 is in need of improvements to handle existing and future coal truck traffic between I-70 and Price, including pavement overlays, bridge construction, and improvements in curves and passing lanes. These improvements include a number of projects already scheduled to be completed within the next few years along the full length of SR-10, projects that are needed regardless of the alternative chosen, and would cost approximately $30,000,000 (Scott Goodwin, UDOT, 2001). In order to accurately compare the costs among alternatives associated with upgrading SR-10, it is necessary to focus on the segment of road, and associated costs, that would experience differences attributable to the four alternatives. This means looking at the first 10.1 miles of SR-10 which would take the analysis to the northernmost junction of the proposed road, the Alternative C junction. Any impacts occurring to the north of that point would be common to all alternatives. With this in mind, the proposed route down Quitchupah Creek would result in eliminating SUFCO coal truck traffic on the segment of SR-10 between I-70 and the proposed SR-10 intersections. See **Figures 1-2** and **1-3** for the location of the three possible intersections with SR-10 associated with Alternatives B/C/D. By eliminating coal truck traffic on this segment of SR-10 south of these proposed intersection locations, there would be savings on SR-10 under alternatives B, C, and D as compared to the No Action alternative. These savings are discussed below under the respective impact sections. There would be no significant difference among any of the four alternatives in routine maintenance costs (e.g. chip seal, surface rejuvenation) on the first 10.1 miles of SR-10.

**Figures 2-3**, **2-7**, and **2-11** show the junctions with SR-10 by Alternative. The Alternative B junction with SR-10 (**Figure 2-3**) would require the widening of the existing bridge in order for it to meet standards and carry the needed turn lanes. The new bridge would be approximately double the width that it is currently. Alternatives C and D junctions with SR-10 (**Figures 2-7** and **2-11**) would not require the widening of the bridge spanning Quitchupah Creek, nor would either require the long acceleration lane since they are in areas of low grade. The costs for construction of these improvements would be the responsibility of the SSD rather than UDOT (See **Table 2.7-1**).

**NO ACTION - ALTERNATIVE A**

Under this alternative, coal would continue to be transported to the east under the current transportation route. This route leaves the SUFCO Mine via the Acord Lakes Road, heads east on I-70, and then north on SR-10 to the Hunter Power Plant and to the rail loadout near Price, Utah (**Figure 1-3**).

The solitude and overall character of Quitchupah Creek canyon would not change under this alternative.

Fuel savings for the SUFCO mine would not occur under this alternative because there would not be a reduction in the round-trip mileage as compared to Alternatives B, C, and D (see those sections below for a discussion of SUFCO fuel savings, by alternative).

Ranching use in the Quitchupah Creek canyon would continue as is, with no changes to ranching operations.

Under this alternative the commuting distance from communities to the east of the SUFCO Mine would not decrease for vendors traveling to the mine or for the Carbon and Emery County residents employed at the mine.

**Table 3.15-5 Annual Estimated Fuel Consumption Under Alternative A**

| Coal Transported per Year | | Number of Truck Trips | |
|---|---|---|---|
| **Year** | **Tons** | **Number of Trips** | **Consumed Fuel Gallons** |
| 2001 | 2,000,000 | 52,632 | 1,450,304 |
| 2002 | 3,000,000 | 78,947 | 2,175,428 |
| 2003 or max | 5,500,000 | 144,737 | 3,988,308 |
| Assumptions: 38 tons of coal per haul, 4.5 miles per gallon. | | | |

The distance from the SUFCO Mine to Salina, in Sevier County, is approximately 30 road miles. The road mile distance from the SUFCO Mine to the town of Emery (population 289) is currently 39.8 miles, and 53.6 miles to Ferron (population 1,611). No savings to fuel consumption and coal transport costs, up to $10M annually, would occur under the No Action Alternative resulting in no competitive advantage to the SUFCO Mine.

Under the No Action alternative current SUFCO Mine coal truck traffic would continue to occur along SR-10 to coal destinations in Emery and Carbon Counties. This alternative does not, when compared to alternatives B, C, D, allow for a reduction in SUFCO Mine coal truck traffic from Fremont Junction on I-70 north along SR-10 to the three possible intersections (**Figure 1-2**) of the proposed Quitchupah Creek coal road with SR-10. In response to this, UDOT Region 4 installed a 3.5 inch pavement overlay to handle the increase in truck traffic from the SUFCO Mine along the first 10.1 miles of SR-10. This upgrade should help to avoid premature fatigue under the No Action alternative in order to accommodate the production associated with the recently signed SUFCO Mine/Pacificorp contract.

Under the No Action alternative SUFCO would not have an alternate means of transporting coal to destinations east of the mine (e.g. Hunter Power Plant and the rail loadout near Price). This alternative would not provide for an alternate coal transport route during any road closures on I-70 (weather, accidents), if a problem were to occur on the existing Acord Lakes road out of the mine, or in the event of an emergency at the mine.

**QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B**

Alternative B involves upgrading the existing road in Quitchupah Creek. The projected construction cost is $5.5 million. The distance upgraded would be 8.9 miles and the round-trip route from the SUFCO Mine to destinations in Emery and Carbon Counties would be reduced by 55.4 miles or 44 percent of the round-trip to the Hunter Power Plant.

In addition, the projected cost to construct the junction with SR-10 is $2.0 million. This includes widening of the bridge over Quitchupah Creek and the long acceleration lane, as well as the necessary turn lanes. These construction costs would be the responsibility of the SSD; future maintenance would be UDOT's responsibility.

**Fuel**

The shorter transport route also means fuel savings as indicated in **Table 3.15-6**.

**Table 3.15-6 Annual Estimated Fuel Conservation Under Alternative B**

| Coal Transported per Year | | Reduction in Fuel Required | | |
|---|---|---|---|---|
| **Year** | **Tons** | **Number of Trips** | **Consumed Fuel Gallons** | **Gallons Conserved as Compared to No Action** |
| 2001 | 2,000,000 | 52,632 | 865,503 | 584,800 |
| 2002 | 3,000,000 | 78,947 | 1,298,239 | 877,188 |
| 2003 or max | 5,500,000 | 144,737 | 2,380,120 | 1,608,188 |
| Assumptions: Reduction in round trip of 50 miles, 38 tons of coal per trip, 4.5 miles per gallon, 11.1 gallons saved per trip. | | | | |

A typical truck transporting coal with double trailers holds 38 tons of coal. The actual fuel mileage of coal trucks varies upon a number of factors such as cargo weight, road grade, and route. An average fuel mileage of 4.5 miles per gallon was assumed based upon conversations with officials in the trucking industry. The projected savings in fuel consumption, as compared to the No Action Alternative, are listed in **Table 3.15-7**. At 5.5 million tons per year, the projected saving in diesel fuel would be 1,608,188 gallons. Savings to fuel consumption and other transport costs under Alternative B as compared to the No Action Alternative would be substantial.

The value of the proposed Quitchupah Creek Road to the SUFCO Mine is measured in the reduction in transport costs and the reduced effort to haul coal. The 55.4 miles saved in travel means the round trip from the SUFCO Mine to the Hunter Generating Power Plant is from 124 miles round trip to 69 miles round trip. This would save about 75 minutes on the round trip. The reduction in mileage would save about 10 percent of the market value of a ton of coal, thus potentially increasing profits by 10 percent. The 10 percent savings for an annual transport of 2-4.5 mmtpy means a considerable cost advantage for the coal producer.

The round trip distance to Hunter Power Generating Plant from the SUFCO Mine is 124 miles, at a cost $0.07/mile/ton the cost for transporting one ton is $4.34 (62 x $0.07 = $4.34). The average price for coal in 2001 was $17.54 per ton (Utah Energy Office, 2001), so the $4.34 transport costs represents 25 percent of the value of a ton of coal in 2001. The proposed Quitchupah Creek Road would reduce the round trip haul distance by 55.4 miles or by 44 percent, and the cost to transport one ton would be reduced by $1.75 or 10 percent of the value of the ton of coal. The SUFCO Mine could save between $4 and 10.8 million annually on transport costs under Alternative B, depending upon tonnage transported.

**Table 3.15-7 Annual Coal Transport Cost Savings**

| Year | Eastern[1] Markets mmtpy | No. of[2] Trips per year | Alternative[3] A savings per trip $0.00 | Alternative[4] B savings per trip $75.25 | Alternative[5] C savings per trip $79.76 | Alternative[6] D savings per trip $63.21 |
|---|---|---|---|---|---|---|
| 2001 | 2.0 | 52,632 | $0.00 | $3,960,558 | $4,197,283 | $4,016,927 |
| 2002 | 2.5 | 65,190 | $0.00 | $4,950,698 | $5,247,410 | $4,158,586 |
| 2003 or max. | 5.5 | 144,737 | $0.00 | $10,891,459 | $11,544,223 | $9,148,825 |

1. 1.0 mmtpy to Savage Loadout + 1.0 mmtpy to Hunter Plant in 2001, 3.1 mmtpy in 2002, 4.5 mmtpy or maximum in 2003
2. Mmtpy divided by 38 ton standard haul load
3. 0 miles less travel x $3.01/load/mile savings (based on industry cost of $0.07/ton/mile) = $0.00
4. 25.0 miles less travel loaded x $3.01/load/mile = $75.25 savings per load
5. 26.5 miles less travel loaded x $3.01/load/mile = $79.76 savings per load
6. 21.0 miles less travel loaded x $3.01/load/mile = $63.21 savings per load

The Quitchupah Road would reduce the burden of transport so the SUFCO Mine could increase profits and remain competitive in the coal industry. Increased profits mean increased capital for exploration of adjacent coal fields to maintain reserves for mine longevity and increased coal resource recovery.

The reduced cost of transporting coal via the proposed Quitchupah Creek Road translates into several opportunities for the SUFCO Mine:

1. The opportunity to remain competitive in a limited coal market.
2. The opportunity to increase profits and attract investors to fund an adequate capital budget.
3. The opportunity to continue to expand coal production and exploration to increase reserves.

The long-term stability of the SUFCO Mine ensures that one-quarter of the Sevier County payroll would continue and one-fifth of the workers would remain employed.

The construction and operation of a public highway in Quitchupah Creek would shorten the commute route from Emery County to the SUFCO Mine by over 50 miles. Emery County has a resource of unemployed experienced coal miners that could benefit from an easier commute to work. Currently 27 miners from Emery County work at the SUFCO Mine. The travel distance from the SUFCO Mine to the Town of Emery would be 12 miles, to Ferron 27 miles, Castledale 34 miles, and Huntington 43 miles. Currently the nearest town to the SUFCO Mine is Salina in Sevier County at a travel distance of 29 miles. With the proposed Quitchupah Creek Road, Emery would be much closer than Salina, the traditional base for the SUFCO Mine.

An economic electrical cost benefit would also accrue, in time, to the electrical energy consuming public and industry. This is achieved through the following means:
The coal company passes the savings on to the power station. The savings is passed on because the company operates in a very competitive energy market segment.

The generating station passes the savings on to the electrical energy consumer. The power companies operate in a regulated environment with a maximum/minimum return on investment or in an open market environment which reacts very quickly to electrical supply and demand forces.

In addition, the decreased transportation cost would allow the SUFCO Mine to recover more of the coal resource and increase the overall recovery. SUFCO Mine personnel have projected up to 11 million additional tons of coal could be recovered if the Quitchupah Creek Road were built, adding some 1.3 years to the life of the mine. These 11 million tons could provide for the electrical needs of some 1.7 million average residential customers for the 1.3 years. This is an energy resource that would otherwise be lost because it would be uneconomic to recover.

**Transportation**
Under Alternative B, savings in highway maintenance costs would occur on SR-10, as compared to the No Action alternative. Again, the first 10.1 mile segment of SR-10 is of concern since all impacts to the highway north of that point are common to all alternatives. The first 8.5 miles of this segment of SR-10 north from I-70 would require a 2" overlay up to the Alternative B junction with SR-10. The remaining 1.6 miles would require a 3.5" overlay. These saving figures, compared to the No Action alternative, are shown below.

| | | |
|---|---|---|
| Alternative B: | 8.5 miles of 2" overlay @ $90,909/mile = | $772,727 |
| | 1.6 miles of 3.5" overlay @ $181,181/mile = | $290,909 |
| | Total Cost = | $1,063,656 |
| No Action: | 10.1 miles of 3.5" overlay @ $181,181/mile = | $1,836,362 |
| Alternative B savings compared to the No Action alternative = | | $772,72 |

In addition, there would be costs of approximately $600,000 to install a passing lane on Quitchupah Hill (Scott Goodwin, UDOT, Region 4).

This alternative would eliminate the probability of traffic collisions with SUFCO coal trucks traveling east on I-70 and on the first 8.5 miles of SR-10.

Under this alternative, the commuting distance from communities to the east of the SUFCO Mine would decrease for vendors traveling to the mine and for Carbon and Emery County residents employed at the mine (5 and 27 respectively).

**Agriculture**
Alternative B is estimated to reduce available forage by 8 AUMs during road construction. Upon reclamation, the final net loss of forage is estimated to be 4 AUMs. This loss represents an insignificant economic impact to the livestock industry in the Study Area. The corrals/holding pens would be constructed as part of this alternative. Livestock trailing would continue as present, with the addition of fenced trail above the Forest Service boundary.

### ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C
Alternative C diverges from the existing Quitchupah Creek Road about 2 miles west of SR-10 and proceeds east to intercept SR-10, approximately 10.1 miles north of the I-70/SR-10 junction (i.e. a point 1.6 miles north of the proposed Quitchupah Creek road junction with SR-10 described under Alternative B). The total round-trip distance saved in transporting coal from the SUFCO Mine to destinations in Emery and Carbon Counties would be 58 miles or 47 percent of the round-trip to the Hunter Power Plant. The projected construction cost is $5.9 million.

In addition, the projected cost to construct the junction with SR-10 is $0.8 million and includes the addition of turn lanes. These construction costs would be the responsibility of the SSD; future maintenance would be UDOT's responsibility.

**Fuel**
The shorter transport route also means fuel savings as indicated in **Table 3.15-8**.

**Table 3.15-8 Annual Estimated Fuel Conservation Under Alternative C**

| Coal Transported per Year | | Reduction in Fuel Required | | |
|---|---|---|---|---|
| **Year** | **Tons** | **Number of Trips** | **Consumed Fuel Gallons** | **Gallons Conserved as Compared to No Action** |
| 2001 | 2,000,000 | 52,632 | 830,416 | 619,888 |
| 2002 | 3,000,000 | 78,947 | 1,245,608 | 929,820 |
| 2003 or max. | 5,500,000 | 144,737 | 2,283,628 | 1,704,608 |
| Assumptions: Reduction in round trip of 53 miles, 38 tons of coal per trip, 4.5 miles per gallon, 11.8 gallons saved per trip. | | | | |

The projected savings in fuel consumption, over the No Action Alternative, are listed in **Table 3.15-8**. At 5.5 million tons per year, the projected saving in diesel fuel would be 1,704,608 gallons. Savings to fuel consumption and other hauling costs under Alternative C as compared to the No Action Alternative would result in a substantial competitive advantage to the SUFCO Mine.

**Costs**
The cost savings are similar to those described under Alternative B. For Alternative C, the cost advantage would increase to 10.5 percent. The total transport cost savings annually for the SUFCO Mine would range from $4 to $11 million depending upon tonnage transported.

The dispersed type of recreational activity that is presently enjoyed in Quitchupah Creek would be impacted by traffic and associated noise from the proposed road. However, opportunities for increased passenger vehicle access would occur under this alternative. Additionally, the sense of solitude in the canyon would experience negative impacts caused by increased traffic, noise, and access. These represent changes to the lifestyles of individuals presently using the canyon for these purposes.

**Transportation**
Under Alternative C, savings in highway maintenance costs would occur on SR-10, as compared to the No Action alternative. Again, the first 10.1 mile segment of SR-10 is examined since all impacts to the highway north of that point are common to all alternatives. The entire 10.1 miles of this segment of SR-10 north from I-70 would require a 2" overlay up to the Alternative C junction with SR-10. There would be no 3.5" overlay needed on this segment. These saving figures, compared to the No Action alternative, are shown below.

| | | |
|---|---|---|
| Alternative C: | 10.1 miles of 2" overlay @ $90,909/mile = | $918,181 |
| | 0 miles of 3.5" overlay @ $181,181/mile = | $0 |
| | Total Cost = | $918,181 |
| No Action: | 10.1 miles of 3.5" overlay @ $181,181/mile = | $1,836,362 |
| Alternative C savings compared to the No Action alternative = | | $918,181 |

Additionally, by locating the entrance of the proposed road onto SR-10 approximately 1.6 miles north of that proposed for Alternative B, costs of $600,000 for a passing lane on Quitchupah Hill would be avoided (Scott Goodwin, UDOT, Region 4).

This alternative would eliminate the probability of traffic collisions with SUFCO coal trucks traveling east on I-70 and on the first 10.1 miles on SR-10.

Under this alternative the commuting distance from communities to the east of the SUFCO Mine would decrease for vendors traveling to the mine and for Carbon and Emery County residents employed at the mine.

**Agriculture**
Alternative C is estimated to impact the same amount of land and forage as Alternative B. The corrals/holding pens would be constructed as part of this alternative. Livestock trailing would continue as present, with the addition of the fenced trail above the Forest Service boundary.

**WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D**
Alternative D follows Quitchupah Creek for 2 miles from the Acord Lakes Road, then follows and crosses Water Hollow south to Water Hollow Benches and Saleratus Benches. The route then turns north to connect with SR-10 at a point about 6.2 miles north of the SR-10 intersection with I-70. The round-trip distance saved would be 46.7 miles or 34 percent of the round-trip from the SUFCO mine to the Hunter Power Plant. The projected construction cost is $13.5 million.

In addition, the projected cost to construct the junction with SR-10 is $0.9 million and includes the addition of turn lanes. These construction costs would be the responsibility of the SSD; future maintenance would be UDOT's responsibility.

**Fuel**
The shorter transport route also means fuel savings as indicated in **Table 3.15-9**.

**Table 3.15-9 Annual Estimated Fuel Conservation Under Alternative D**

| Coal Hauled per Year | | Reduction in Fuel Required | | |
|---|---|---|---|---|
| Year | Tons | Number of Trips | Consumed Fuel Gallons | Gallons Conserved as Compared to No Action |
| 2001 | 2,000,000 | 52,632 | 959,072 | 491,232 |
| 2002 | 3,000,000 | 78,947 | 736,839 | 736,839 |
| 2003 or max. | 5,500,000 | 144,737 | 2,637,429 | 1,350,879 |
| Assumptions: Reduction in round trip of 42 miles, 38 tons of coal per trip, 4.5 miles per gallon, 9.33 gallons saved per haul. | | | | |

The projected fuel savings to SUFCO, compared to the No Action Alternative, are listed in **Table 3.15-9**. At 5.5 million tons per year, the projected saving in diesel fuel would be 1,350,879 gallons. Savings to fuel consumption and other transport costs under Alternative D as compared to the No Action Alternative would result in a substantial competitive advantage to the SUFCO Mine.

**Costs**
The cost savings are similar to those described in Alternatives B and C.

**Transportation**
Under Alternative D, savings in highway maintenance costs would occur on SR-10, as compared to the No Action alternative. Again, the first 10.1 mile segment of SR-10 is examined since all impacts to the highway north of that point are common to all alternatives. The first 6.2 miles of this segment of SR-10 north from I-70 would require a 2" overlay up to the Alternative D junction with SR-10. The remaining 3.9 miles would require a 3.5" overlay. These savings figures, compared to the No Action alternative, are shown below.

| | | |
|---|---|---|
| Alternative D: | 6.2 miles of 2" overlay @ $90,909/mile = | $563,636 |
| | 3.9 miles of 3.5" overlay @ $181,181/mile = | $709,090 |
| | Total Cost = | $1,272,726 |
| No Action: | 10.1 miles of 3.5" overlay @ $181,181/mile = | $1,836,362 |
| Alternative D savings compared to the No Action alternative = | | $563,636 |

In addition, there would be costs of approximately $600,000 to install a passing lane on Quitchupah Hill. (Scott Goodwin, UDOT, Region 4).

This alternative would eliminate the probability of traffic collisions with SUFCO coal trucks traveling east on I-70 and on the first 6.2 miles on SR-10.

Under this alternative the commuting distance from communities to the east of the SUFCO Mine would decrease for vendors traveling to the mine and for Carbon and Emery County residents employed at the mine.

**Agriculture**
Under Alternative D, there would be an initial loss of 12 AUMs and after reclamation a minimal loss of 5 AUMs. Livestock trailing would continue as present with the addition of the fenced trail above the Forest Service boundary.

## MITIGATION AND MONITORING

**No Action Alternative:**
No mitigation would be necessary.

**Alternatives B, C, D:**
The fenced trail would minimize costs due to livestock-road collisions.

**Alternative D:**
No mitigation is planned.

## IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

### NO ACTION ALTERNATIVE

The existing SUFCO fuel consumption and associated costs to truck coal via the existing routes on Acord Lakes/I-70/SR-10 would continue. As compared to the build alternatives (B, C, D), the difference in fuel consumption would be irreversibly and irretrievably lost under the No Action alternative.

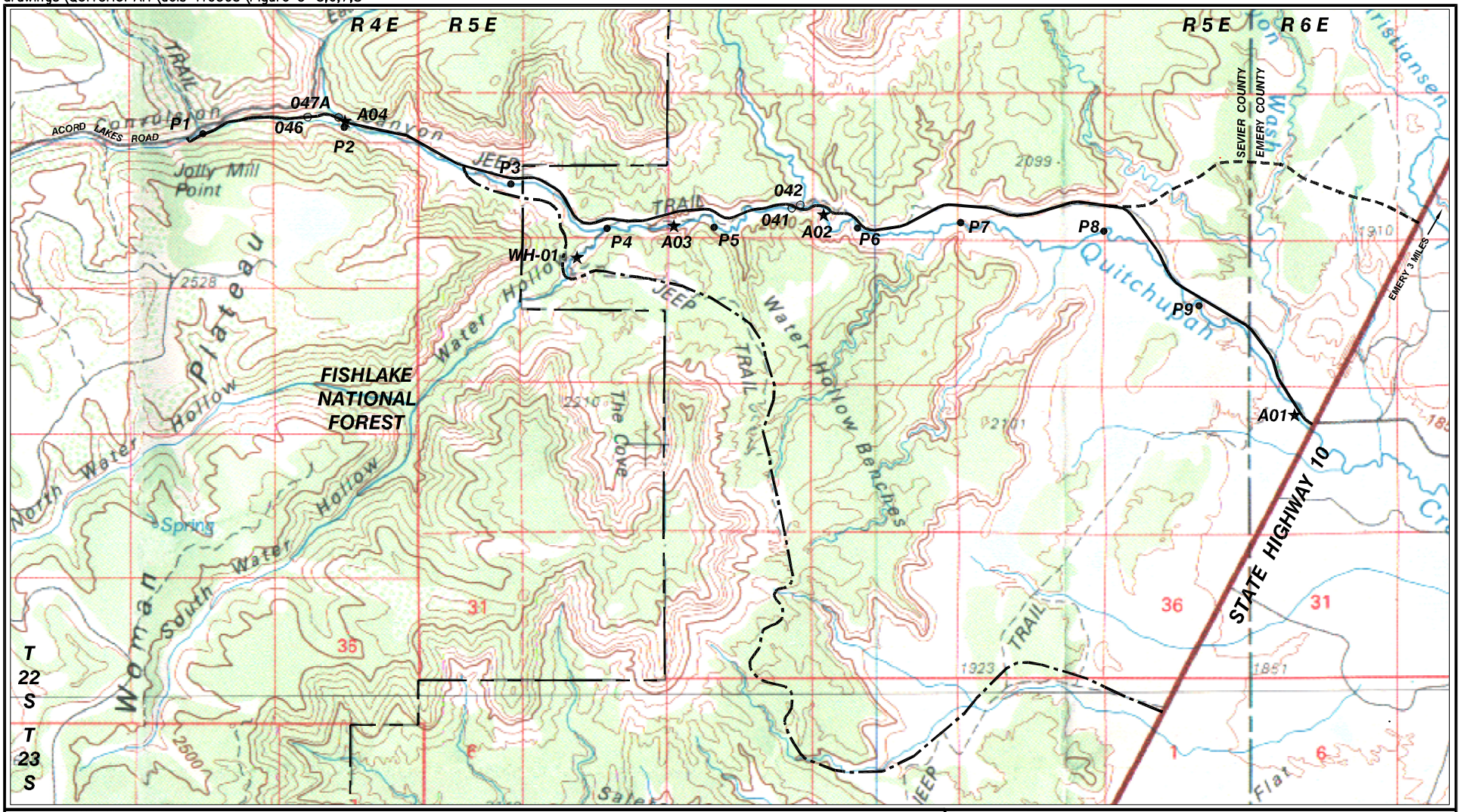
**Alternatives B, C, D**
The solitude, recreation opportunities, and overall remote character of Quitchupah Creek canyon would be irretrievably lost to those individuals using the canyon for those purposes.

The loss of AUMs would be irretrievably lost with construction of a road through the canyon.

**CUMULATIVE EFFECTS**
The SUFCO Mine may continue to increase coal production due to an expanding market for coal-fired electrical generation regardless of the alternative selected. This could lead to other coal tracts being leased and mined, in addition to the Muddy tract. Coal-fired electrical generation plants in the Midwest and east have an increased need for low-sulfur, high-btu coal to meet the requirements of the Clean Air Act, generating another eastern market for Utah coal.

The transport of coal from the CONSOL Mine in Emery County would combine with the coal truck traffic from the SUFCO Mine to increase coal truck traffic on SR-10 and through the towns of Emery, Ferron, Clawson, and Castledale. This may lead to increased spending on SR-10 to maintain the highway, as well as increased noise and traffic hazards for this stretch of SR-10. The increased coal production would also increase revenues and subsequent expenditures in Carbon, Emery, and Sevier Counties.

drawings\QUITCHUPAH\deis 110305\Figure 3-3,6,7,8




EXPLANATION

- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D
- PFANKUCH STABILITY RATING SITE
- AQUATIC STUDY REACH
- CANYON FUELS MONITORING STATIONS

N

1 0 1 MILE

# QUITCHUPAH CREEK ROAD EIS

## FIGURE 3-1
## HYDROLOGY MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE |
|---|---|---|---|
| KK | CP | | 1"= 1 Mile |

| REVISION | DATE DRAWN |
|---|---|
| | 12/09/02 |
| | 6/13/03 |
| | 07/14/05 |
| | 11/03/05 |

BEGIN PROJECT

END PROJECT

QUITCHUPAH CREEK ROAD ALTERNATIVE B

WATER HOLLOW ALTERNATIVE B

ALTERNATE JUNCTION ALTERNATIVE C

WATER HOLLOW ALTERNATIVE D

EMERY 4.5 MILES

FISHLAKE NATIONAL FOREST BOUNDARY

SEVIER COUNTY

EMERY COUNTY

STATE HIGHWAY 10

OLD WOMAN PLATEAU

FISHLAKE NATIONAL FOREST

Water Hollow Benches

Saleratus Benches

EXPLANATION

ROAD ALIGNMENT

SOIL MAPPING UNIT BOUNDARY

? UNSURVEYED AREAS

RIB UNIT IDENTIFICATION

SOIL SURVEY BOUNDARY

NOTE: SOIL SURVEY BASED ON PRELIMINARY MAPS FROM N.R.C.S & U.S.F.S. – SUBJECT TO CHANGE

N

3200 0 3200 FEET

# QUITCHUPAH CREEK ROAD EIS

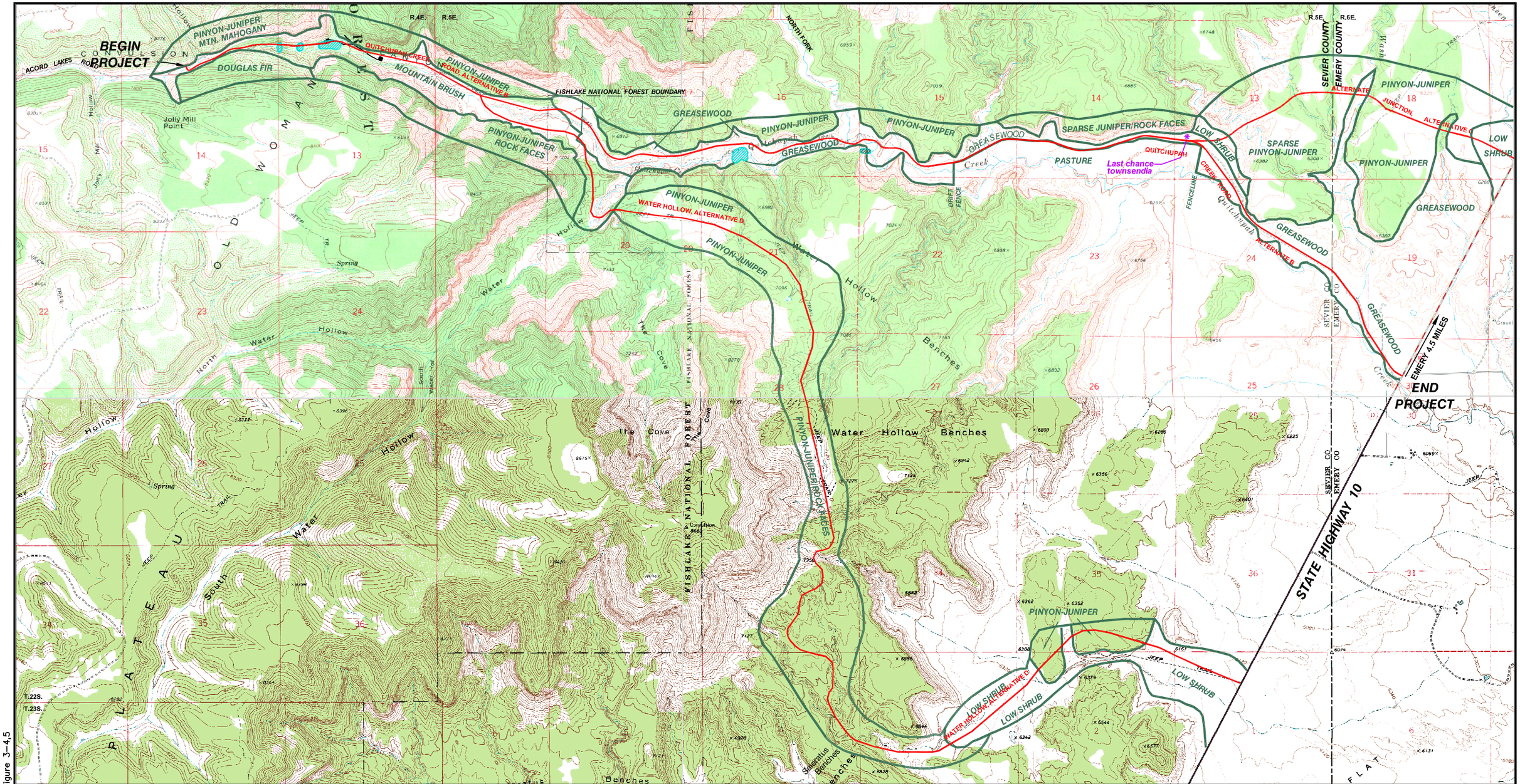
FIGURE 3–2
SOILS MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE |
|---|---|---|---|
| KK | CP | | 1"=3200' |

| REVISION | DATE DRAWN |
|---|---|
| | 7/01/02 |
| | 11/09/02 |
| | 6/13/03 |
| | 10/18/01 |

drawings\QUITCHUPAH\deis 110305\Figure 3-4,5




EXPLANATION

ROAD ALIGNMENT

VEGETATION

VEGETATION MAPPING UNIT BOUNDARY

WETLAND

* PREVIOUSLY RECORDED TES PLANT LOCATION

N

3200 0 3200 FEET

# QUITCHUPAH CREEK ROAD EIS

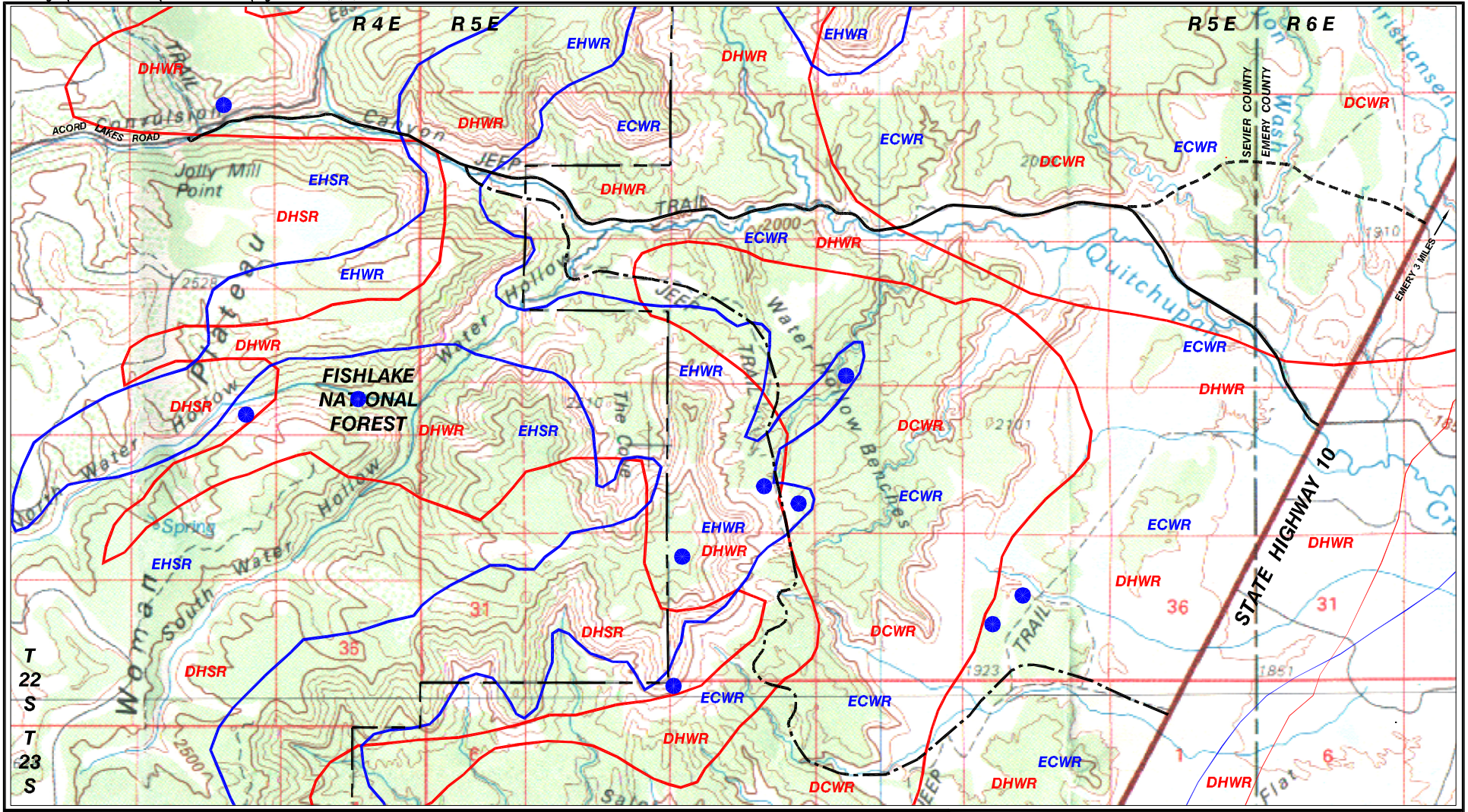
FIGURE 3–3
VEGETATION

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE | DATE DRAWN | REVISION |
|---|---|---|---|---|---|
| LM | CP | | 1"=3200' | 6/11/03 | 6/13/03 |
| | | | | | 7/14/05 |
| | | | | | 11/03/05 |

drawings\QUITCHUPAH\deis 110305\Figure 3-4,5

drawings\QUITCHUPAH\deis 061306\Figure 3-3,6,7,8




REFERENCE: STATE OF UTAH NATURAL RESOURCES, DIVISION OF WILDLIFE RESOURCES, MULE DEER HABITAT UDWR 1/2001

EXPLANATION

- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D
- DEER SUMMER & WINTER RANGE BOUNDARIES
- DHSR DEER HIGH VALUE SUMMER RANGE
- DHWR DEER HIGH VALUE WINTER RANGE
- DCWR DEER CRITICAL WINTER RANGE
- NOTE: BOUNDARIES ARE APPROXIMATE
- ELK SUMMER & WINTER RANGE BOUNDARIES
- EHSR ELK HIGH VALUE SUMMER RANGE
- EHWR ELK HIGH VALUE WINTER RANGE
- ECWR ELK CRITICAL WINTER RANGE
- ELK HELICOPTER COUNTS 1997 (UDWR)

1 0 1 MILE

N

# QUITCHUPAH CREEK ROAD EIS

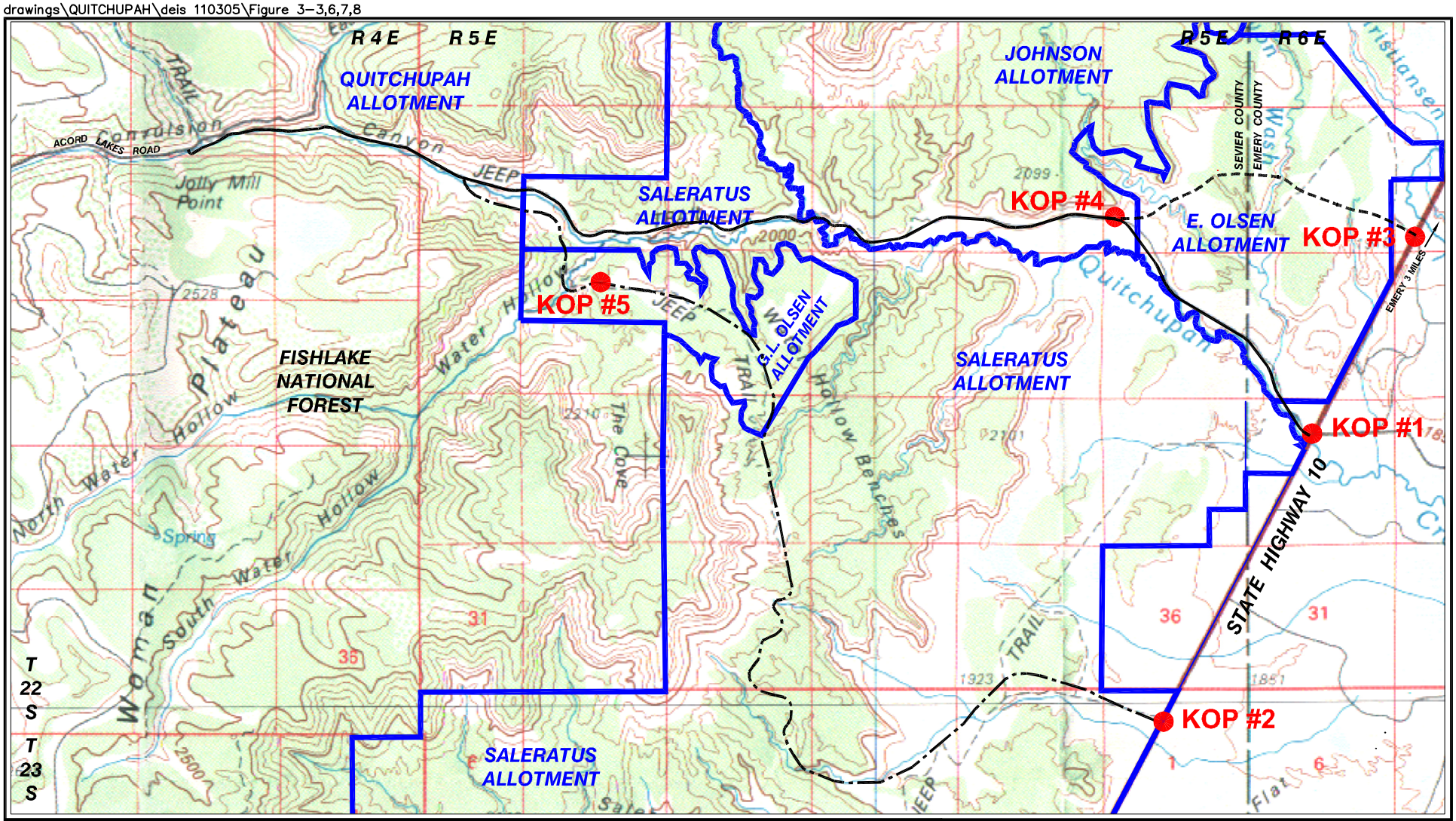
## FIGURE 3-4
## DEER AND ELK HIGH VALUE SUMMER AND WINTER RANGES

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE |
|---|---|---|---|
| GB | CP | | 1"=1 Mile |

| REVISION | DATE DRAWN |
|---|---|
| | 8/05/02 |
| | 12/09/02 |
| | 6/13/03 |
| | 11/03/05 |

drawings\QUITCHUPAH\deis 110305\Figure 3-3,6,7,8




EXPLANATION

- QUITCHUPAH CREEK ROAD, ALTERNATIVE B
- ALTERNATE JUNCTION, ALTERNATIVE C
- WATER HOLLOW, ALTERNATIVE D
- GRAZING ALLOTMENT BOUNDARY
- KEY OBERVATION POINT (KOP)

N

1 0 1 MILE

# QUITCHUPAH CREEK ROAD EIS

## FIGURE 3-5
## GRAZING ALLOTMENT MAP AND KOP LOCATIONS

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

| DESIGN BY | DRAWN BY | CH'D BY | SCALE |
|---|---|---|---|
| KK | CP | | 1"= 1 Mile |

| REVISION | DATE DRAWN |
|---|---|
| | 6/13/03 |
| | 6/27/03 |
| | 9/28/05 |
| | 11/03/05 |

# Chapter 4

# Consultation and Coordination

# 4.0 CONSULTATION AND COORDINATION

## 4.1 Scoping Summary

Issues and concerns were identified through solicitation of public and internal scoping comments. The public and internal comments were then categorized into issues. The issues were examined to determine if they were outside the scope of the Proposed Action or analysis, already decided (by law or regulation, etc.), irrelevant to the decision, or not affected by the Proposed Action. Issues determined to fall into one of these categories were dropped from further analysis. The remaining issues became key issues to be analyzed in the EIS.

Issues have been identified through the scoping process. This process included contact with interested citizens, groups, organizations, and agencies, which included the following:

BLM & Forest permittees and cooperators;
BLM & Forest visitors;
BLM & Forest employees;
Federal, State, and local elected officials;
Federal, State, and local agencies;
Affected landowners;
Key members of the community (opinion leaders);
Industry contacts;
Affected Native American tribes;
Environmental community contacts; and
Interested individuals

**SUMMARY OF COMMENTS**
A total of 35 comment letters or forms were initially received as a result of the EIS scoping effort. Approximately 25 comments had previously been received during scoping for the EA in January-February 1999. Consultation with interested parties has been ongoing throughout the NEPA process. The decision was made by the USFS and BLM to carry over all comments made during the EA scoping into the official record of scoping for the EIS. Comments received cover a large area of concern involving many resource issues. The Summary of Scoping Document, on file at the Fishlake National Forest Office and the BLM Richfield Field Office in Richfield, Utah, contains a summary of the scoping issues and all of the comments received during scoping.

After release of the Draft EIS, 409 public comment letters or forms were received. The comment period extended from December 1, 2001 through February 15, 2002, although additional letters were received and addressed after that time. The letters were examined for key issues and comments. Each comment letter was addressed accordingly. Comment letters and responses can be found in Chapter 6 of this document.

## 4.2 Public Involvement Plan Summary

Public involvement is an important part of the NEPA process. The purpose of the Public Involvement Plan is to describe in detail the methods and techniques used to involve the public in development of the Quitchupah Creek Road EIS. It allows the public to participate actively in the NEPA process and to communicate their concerns regarding the Proposed Action. In addition, involvement by local governments helps the agencies anticipate the effects and benefits that could occur from the project and allows them to make necessary plans and changes in public policy. The goal of the Public Involvement Plan is to gain public understanding and participation in the analysis and decision-making process regarding the proposed Quitchupah Creek Road Project. The goal is also to assure that the public's concerns are evaluated and addressed in the EIS being prepared for this road construction, and to detail how public input will be encouraged through the process.

**IMPLEMENTATION**
A Public Involvement Plan was prepared for the Quitchupah Creek Road Project documenting how the public will be kept informed during the EIS process. The phases of public participation included the following:

- Early and widespread notice of the Proposed Action
- Identification of public issues and concerns to be expressed in the analysis
- Identification of those issues not to be analyzed with an explanation why
- Sharing of resources and analytical data with the public
- Solicitation and incorporation of public input in development of Alternatives
- Prediction of environmental impacts in areas of concern raised by the public
- Invite public review and obtain formal public comment on the DEIS
- Analyze and respond to DEIS public comments in the FEIS

## 4.3 Agencies, Organizations, and Persons to Whom Copies of the Statement Are Sent

The original mailing list for the Quitchupah Creek Road EA was generated on January 15, 1999. Subsequently, the USFS and BLM determined that the proposed project warranted the preparation of an EIS. On July 7, 1999, a revised EIS mailing list was generated and encompassed 213 parties. This list represented all individuals, agencies, or groups who have expressed interest in similar projects. The mailing list has been continuously revised by either adding individuals who did respond or deleting individuals who did not respond (either verbally or in writing) to the scoping letter, legal notices, Notice of Intent, or amended Notice of Intent, or Draft EIS.

Commenters on the November 2001 Draft EIS were added to the mailing list when mailing addresses were provided. A follow-up post card mailing to the commenters and those from the above-described list (from scoping) in spring 2002 provided for commenting parties and others with standing in the EIS process to update their mailing address, or choose to be removed from the mailing list. The Final EIS distribution list is presented on the following pages.

## Federal Agencies:

(NOTE: Number in parenthesis indicates number of hardcopies sent. A number followed by "cd" indicates number of cd copies sent. An asterisk (*) indicates that the agency wishes to be notified of EIS posting to the web.)

Advisory Council on Historic Preservation (*)
Director, Planning and Review
1100 Pennsylvania Ave., NW
Suite 809
Washington, DC 20004

Bureau of Land Management
Washington Office (2)
1849 C Street NW
Washington DC 20240

Bureau of Land Management
Utah State Office (2)
P.O. Box 45155
Salt Lake City, UT 84145-0155

Bureau of Land Management
Price Field Office (1)
125 South 600 West
Price, UT 84501

Bureau of Land Management
Richfield Field Office (1)
Cornell Christiansen, Field Manager
150 East 900 North
Richfield, UT 84701

Bureau of Land Management
State Archaeologist (cd or *)
Portillo, Garth J.
324 South State St.
Salt Lake City, UT 84111

Environmental Protection Agency
Office of Federal Activities
EIS Filing Section (5)
Mail Code 2252-A, Room 7241
Ariel Rios Building
(South Oval Lobby)
1200 Pennsylvania Ave., NW
Washington, DC 20460

Environmental Protection Agency
Region 8 (5)
EIS Review Coordinator
999 18th Street, Suite 500
Denver, CO 80202-2466

Federal Aviation Administration
Northwest Mountain Region (*)
Regional Administrator
1601 Lind Avenue, SW
Renton, WA 98055-4056

Federal Highway Administration
Division Administrator (*)
2520 West 4700 South, Suite 9A
Salt Lake City, UT 84118-1847

Forest Service - USDA (3)
Ecosystem Management Coordinator
P.O. Box 96090
Washington, DC 20090-6090

Forest Service - USDA (1)
Linda L. Jackson, District Ranger
Chino Valley Ranger District
Prescott National Forest
735 N Hwy 89
Chino Valley, AZ 86323

Forest Service – USDA (1 cd)
Intermountain Region
324 25th Street
Ogden, UT 84401

Forest Supervisor
Manti-LaSal National Forest (1)
599 West Price River Drive
Price, UT 84501

Natural Resource Cons. Service
District Conservationist (1)
350 North 400 East
Price, UT 84501

Natural Resource Cons. Service
National Environmental
Coordinator (*)
U.S. Dept. Of Agriculture
P.O. Box 2890, Room 6158-S
Washington, DC 20013-2890

U.S. Army Corps of Engineers (1)
Nancy Kang
533 West 2600 South Suite 150
Bountiful, UT 84010

.U.S. Army Corps of Engineers (1)
Matt Hirkala
Sacramento District
Utah Regulatory Office
533 West 2600 South, Suite 150
Bountiful, UT 84010

U.S. Army Engineer Division, South Pacific
CESPD-CMP (*)
333 Market Street, Rm 1101
San Francisco, CA 94105-2195

U.S. Coast Guard (USCG)
Environmental Impact Branch (*)
Marine Environmental Protection Division
G-MEP
2100 2nd Street, SW
Washington, DC 20593

U.S. Department of Energy
Director, Office of NEPA Policy and Compliance (*)
1000 Independence Avenue, SW
Mail Code EH-442, Room 3E094
Washington, DC 20585

U.S. Department of the Interior
Office of Environmental Policy and Compliance,
Director (1, *)
Main Interior Bldg., MS-2340
1849 C Street, NW
Washington D.C. 20240

U.S. Fish & Wildlife Service
Henry Maddux, Field Supervisor (1)
2369 West Orton Circle
West Valley City, UT 84119

U.S. Fish & Wildlife Service (1)
Susan Linner
Colorado Field Office
P.O. Box 25486, DFC
Denver, CO 80225

U.S. Navy (USN)
Office of Chief of Navy Operations (*)
Environmental Protection Division
ATTN: OP-45
Washington, DC 20350

USDA APHIS PPD/EAD (*)
Deputy Director
4700 River Rd. Unit 149
Riverdale, MD 20737-1238

USDA, National Agric. Library (1, 2 cd, *)
Head, Acquisitions & Serials Branch
10301 Baltimore Blvd., Rm.002
Beltsville, MD 20705

## State and Local Agencies, Officials, and Interest Groups:

(NOTE: One cd of EIS sent to each address unless otherwise indicated.)

Alliance for the Wild Rockies
Dave Bell
P.O. Box 8421
Missoula, MT 59807

American Fisheries Society
Executive Director
5410 Grosvenor Lane
Bethesda, MD 20814

Back Country Horsemen Of Central Utah
P. O. Box 621
Richfield, UT 84701

Beaver County Commission
P. O. Box 392
Beaver, UT 84713

Castle Valley Special Service District - Darrel Leamaster
P. O. Box 877
Castle Dale, UT 84513

Forest Guardians
1411 Second Street
Santa Fe, NM 87505

Governor Jon Huntsman Jr.
P.O. Box 142220
Salt Lake City, UT 84114-2220

Mayor Wade Bradshaw
Beaver City
P. O. Box 271
Beaver, UT 84713

Mayor of Fillmore
P.O. Box 687
Fillmore, UT 84631
Mayor of Loa
P. O. Box 183
Loa, UT 84747

Mayor Michael J. Williams
Emery City
15 South Center
Emery, UT 84522

Cameron, Charles
BIA Uintah and Ouray
988 S. 7500 E.
Ft. Duchesne, UT 84026

Castledale Library (1)
145 North 100 East
Castledale, UT 84513

City of Emery
P. O. Box 108
Emery, UT 84522

Commissioner G. LaVar Cox
Six County Assoc. of Gov't.
P. O. Box 820
Richfield, UT 84701

Congressman James V. Hansen
301 Creamer-Nobel Building
435 East Tabernacle
St. George, UT 84770

Congressman Chris Cannon
51 South University Avenue, #317
Provo, UT 84606

Emery County Commission
75 East Main
Castle Dale, UT 84513

Emery County Economic Dev.
P.O. Box 297
Castle Dale, UT 84513

Emery County Public Lands
Ray Peterson, Director
75 East Main Street
P.O. Box 1298
Castle Dale, UT 84513

Emery County Road Department
Rex Funk, Director
300 North 1st West
P. O. Box 889
Castle Dale, UT 84513

Emery Water Conservancy District
Jay Mark Humphrey
P. O. Box 998
Castle Dale, UT 84513

Burshia, Ben - Field Rep.
BIA Southern Paiute Office
180 N. 200 E., Suite 111
St. George, UT 84771

Betsy Chapoose
Cultural Rights and Protection Dept. Director
Ute Indian Tribe
P. O. Box 190
Fort Duchesne, UT 84026

Hopi Tribal Council, Chairperson
P. O. Box 123
Kykotsmovi, AZ 86039

Mineral Resource Specialist
John Blake
State Trust Lands Admin.
675 East 500 South, Ste. 500
Salt Lake City, UT 84102

Paiute Indian Tribe of Utah
Lora Tom, Chair
440 North Paiute Drive
Cedar City, UT 84720

Paiute County Commission
550 North Main Street
Junction, UT 84740

Raven Rock Art Tours
Craig Barney
P.O. Box 1397
Moab, UT 84532

Representative Bradley T. Johnson
30 North Main St.
P. O. Box 122
Aurora, UT 84620

Sanpete County Commission
160 North Main Street
Manti, UT 84642

Senator Robert F. Bennett
51 South University Ave, #310
Provo, UT 84601

Senator Orrin G. Hatch
51 South University Ave, #320
Provo, UT 84601

Sevier County Commission (1)
250 North Main Street
Richfield, UT 84701

Sevier County Special Service District #1 (1)
250 North Main
Richfield, Utah 84701

Sevier Co. Public Lands
R. Okerlund & G. Mason
250 North Main
Richfield, Utah 84701

Sierra Club-Ogden Group
Frank R. Chas
2587 W. 5950 S.
Roy, UT 84067

Six County AOG
Sevier County Courthouse
250 North Main
Richfield, Utah 84701

Southeastern Utah Association of Local Governments
Bill Howell, Executive Director
P. O. Drawer 1106
Price, UT 84501

Skyline Mine (1)
Wess Sorensen, Gen. Manager
HC 35 Box 380
Helper, UT 84526

SUFCO Mine (1)
Ken May, General Manager
397 S. 800 W.
Salina, UT 84654

Southern Utah Wilderness
(1)Alliance – Liz Thomas
P.O. Box 968
Moab, UT 84532

Triune, Inc.
2328 I-70 Frontage Road
Grand Junction, CO 81505

Utah Dept. of Community & Economic Development
Division of Indian Affairs
Forrest S. Cuch
Executive Director
324 South State Street, # 500
Salt Lake City, UT 84111

Utah Dept. of Env. Quality
Dianne R. Nielson
P.O. Box 144810
Salt Lake City, UT 84114-4810

Utah Dept. of Env. Quality
Division of Water Quality
Walter L. Baker, Director
P.O. Box 144870
Salt Lake City, UT 84114-4870

Utah Dept. of Env. Quality
Division of Water Quality
Rand Fisher, Env. Scientist
P.O. Box 144870
Salt Lake City, UT 84114-4870

Utah Dept. of Transportation
Ross Christenson, District Engineer
708 South 100 West
Richfield, UT 84701

Utah Dept. of Transportation R4
Hugh Kirkham
Price District Director
940 South Carbon Ave.
Price, UT 84501

Utah DNR Div. of Water Rights, Southeast Regional Office
Mark Page, Regional Engineer
P. O. Box 718
Price, UT 84501-0718

Val Payne
5110 State Office Building, Public Lands
Salt Lake City, UT 84114

Utah DNR DOGM
John Baza, Director
PO Box 145801
Salt Lake City, Utah 84114

Utah DNR DOGM
Peter Hess, Mining Engineer
Price Field Office
455 West Railroad Ave.
Price, UT 84501

Utah DNR DOGM
Mary Ann Wright, Associate Director - Mining
P.O. Box 145801
Salt Lake City, UT 84114-5801

Utah Division of State Lands & Forestry
130 North Main
Richfield, UT 84701

Utah Div. of Wildlife Resources
P.O. Box 146301
Salt Lake City, UT 84114-6301

Utah Div. of Wildlife Resources
Chris Colt
475 West Price River Dr., Ste. C
Price, UT 84501-2860

Utah Div. of Wildlife Resources
Southern Region Office
Doug Messerly, Supervisor
P. O. Box 606
Cedar City, UT 84721-0606

Utah Div. of Wildlife Resources
Southeastern Region
Derris Jones, Supervisor
475 West Price River Dr., Ste. C
Price, UT 84501-2860

Utah Environmental Congress
Craig Axford (1)
1817 South Main Street # 10
Salt Lake City, UT 84115

Utah Geological Survey
State Energy Program
Denise Beadoin, Manager
P.O. Box 146100
Salt Lake City, UT 84114-6100

Utah Governors Office of
Planning and Budget
Richard Ellis, Exec. Director
P.O. Box 142210
Salt Lake City, UT 84114-2210

Utah Governor's Office of
Planning & Budget, Resource
Development Coord. Comm.
John Harja, Exec. Director
State Office Building, Rm. 5110
Salt Lake City, UT 84114

Utah School and Institutional
Trust Lands Admin.
Louis Brown, Realty Specialist
Central Area Office
130 North Main Street
Richfield, UT 84701-2154

Utah Wilderness Association
Dick Carter
190 South 100 West
Hyrum, UT 84319

Mr. John Baughman, Executive
Vice President
International Association of Fish
& Wildlife Agencies
444 N. Capitol St, NW, #544
Washington, DC 20001

Wayne County Commission
18 South Main Street
Loa, UT 84747

## Individuals:

Abraham, Terry
160 South 500 West
Richfield, Utah 84701

Adams, Jerry
209 West 300 South
Richfield, Utah 84701

Jori Adams
915 N. Hwy 89
Joseph, UT 84739

Adams, Steven
P.O. Box 286
Ferron, UT 84523

Albrecht, Danny H.
495 North 500 West
Richfield, Utah 84701

Allen, George
269 North 300 West
Richfield, UT 84701

Allen, Mark
P.O. Box 253
Orangeville, UT 84537

Allred, Guy
PO Box 161
Cleveland, Utah 84518

Allred, Casey
PO Box 333
Cleveland, Utah 84518

Allred, Mike
Box 344
Cleveland, UT 84518

Anderson, Bill
Orangeville, UT 84537

Anderson, Mitchell
PO Box 220085
Centerfield, Utah 84622

Anderson, Teddy
390 North honey Drive
Salina, Utah 84654

Anderson, J.W.
566 West 200 North
Richfield, UT 84701

Anderson, Wayne L.
290 North 300 East
Centerfield, Utah 84622

Anderson, Jeffrey D.
PO Box 606
Gunnison, Utah 84634

Anderson, Glen R.
P.O. Box 101
Emery, UT 84522

Eric R. Anderson
P.O. Box 587
Emery, UT 84523

Lyle D. & Belle V. Anderson
P. O. Box 523
Emery, UT 84522

Randy Anderson, Auctioneer
RMA Sales Management Co.
Box 77
Emery, UT 84522

Robert Anderson, President (1)
Quitchupah Grazers Association
Emery, UT 84522

Tim Anderson
P.O. Box 570126
Sigurd, UT 84657

Dr. Duane Atwood
BYU -- 2-0 MLBM
P.O. Box 20200
Provo, UT 84602-0200

Austin, Billy
4301 North Spring Glen Road
Helper, UT 84526

Averett, Leo
30 East 2nd Street
P.O. Box 220153
Centerfield, UT 84622

Axelgard, M. K.
615 East 300 North
Price, Utah 84501

Bagley, Daryl
537 South 500 West
Mount Pleasant, UT 84647

Bagley, Marvin D. Atty. (1)
Castle Valley Ranches
180 N. 100 E. Suite F
Richfield, UT 84701

Baker, Jeannine
40 North State Street
Joseph, Utah 84793

Balatas, Arty
Box 372
Orangeville, UT 84537

Ball, Kenny
PO Box
Redmond, Utah 84652

Banks, Roberts C.
30 East 100 North
PO Box 196
Monroe, Utah 84754

Barclay, Michael
Barclay Mechanical Services, Inc.
595 West 100 North
Manti, Utah 84642

Barney, Bud
145 Sunnybrook Drive
Salina, Utah 84654

Barney, Glen M.
198 North 3rd East
Salina, Utah 84654

Barney, Lane W.
380 E. Main St.
Salina, UT 84654

Barney, Rex
90 South 200 West
Central Valley, Utah 84754

Barney, Tony
193 East 300 West
Richfield, UT 84701

Barry, Amy
633 Evans Ave.
Missoula, MT 59801

Barton, Brady
385 North 100 West
Manti, Utah 84642

Bastian, Kathy
PO Box 394
Aurora, Utah 84620

Bastian, Grant
333 West Bastian Lane
Sigurd, Utah 84657

Bates, John F.
Attorney-at-Law
455 South 300 East #200
Salt Lake City, UT 84111

Beach, Chad
136 S. 200 E.
Salina, UT 84654

Beach, Neil
175 South 100 East
Salina, Utah 84654

Brad Barney
145 Sunnybrook Dr.
Salina, UT 84654

Scott Beckstead
Robinson Transport
55 West 200 South
Salina, UT 84645

Steve Behling
CONSOL, Emery Mine
P. O. Box 527
Emery, UT 84522

Mark Belles
9318 Willard Street
Rowlett, TX 75088

Bess, Odis
435 West 400 North
Richfield, UT 84701

Billings, Arvin
P.O. Box 397
Nephi, UT 84648

Bills, Dick A.
238 South 100 East
Salina, Utah 84654

Bizllow, Boyd
P.O. Box 11
Elsinore, UT 84724

Black, John M.
245 South Main
Monroe, Utah 84754

Morris E. Blackburn
P. O. Box 1
Emery, UT 84522

Senator Leonard Blackham
P. O. Box 337
Moroni, UT 84646

Janine Blaelock, Director
Western Land Exchange Project
P. O. Box 95545
Seattle, WA 98145-2545

Julian L. Bowman
P.O. Box 141
Huntington, UT 84528

Brandon, Michael J.
200 East 215 East
Aurora, UT 84620

Duane & Dora Jane Bresee
195 East 500 North
Richfield, UT 84701

Brotherson, Carrie
540 South Aspen Circle
Salina, Utah 84654

Brown, Darwin
PO Box 81
Loa, Utah 84747

Brown, Skip D.
PO Box 521
Loa, Utah 84747

Brown, Dale P.
690 East 500 North
Richfield, Utah 84701

Brown, Larry
PO Box 221
Orangeville, Utah 84537

Brown, Dwayne K.
455 West 400 North
Salina, Utah 84654

Bown, Paul
PO Box 220426
Centerfield, Utah 84622

Brown, Jody
PO Box 146
Loa, Utah 84747

Brown, Sam
PO Box 21052
Axtell, Utah 84621

Bruno, Martin R.
76 South 300 East
Helper, Utah 84526

Buchanon, Blaine
160 Lariet Drive
Sigurd, UT 84657

Buckland, Ken
299 South 300 East
Axtell, Utah 84621

John L. & Vickie Byars
P.O. Box 576
Emery, UT 84522

Thomas C. Bunn (1)
88 West 500 South
Wellsville, UT 84339

Marty Burgess
921 N. Smith Dr.
Price, UT 84501

Burr, Wesley
PO Box 387
Redmond, Utah 84652

Butcher, Rodney
PO Box 220013
Centerfield, Utah 84622

Caldwell, Paul
45 East 300 south
Gunnison, Utah 84634

Chatson, Mark E.
P.O. Box 220169
Centerfield, UT 84622
Chavis, Dan
910 North Brooklyn Road
Monroe, UT 84754

Chidester, Dan S.
731 Horseshoe Drive
Richfield, Utah 84701

Child, Scott M. (President)
Interwest Mining Company
One Utah Center
201 South Main St. Suite 2100
SLC, Utah 84140-0021

Christensen, F. La Mar
425 Sunnybrook
Salina, UT 84654

Christensen, Cody
385 South
Elsinore, UT 84724

Christensen, Dale
PO Box 69
Redmond, UT 84652

Christensen, Lance
100 North 95 West
Elsinore, Utah 84724

Christiansen, Dirk
PO Box 69
Redmond, Utah 84652

Ken Christiansen
Emery Stock Growers
P. O. Box 552
Emery, UT 84522

Merlin Christiansen
P. O. Box 36
Emery, UT 84522

Clayton, Caroline F.
PO Box 63
Mayfield, Utah 84643

Colby, Ryan
285 North 689 West
Salina, UT 84654

Cook, Dan
39 North 500 East
Richfield, UT 84701

Craig Cox
Utah Power & Light Company
Environmental Services Dept.
1407 West North Temple, #3306
Salt Lake City, UT 84140

Crofts, Kelley
761 north 300 East
Richfield, Utah 84701

Curtis, Kim
PO Box 174
Aurora, Utah 84620

Dale, Joseph R.
230 South 200 North
Ferron, Utah 84523

Dano, Tom
RR 1 Box 27-F
Fairview, UT 84629

Davis, Michael
PO Box 368
Aurora, Utah 84620

Davis, Michael L.
260 Sunny Brook
Salina, Utah 84654

De Lange, Jon
280 East 300 North
Glenwood, Utah 84730

H. C. Deutschlander
P.O. Box 190055
Brian Head, UT 84719

Devin, Sean
95 North 100 West
P.O. Box 220305
Centerfield, UT 84622

Dickinson, Bob
140 South 500 West
Richfield, Utah 84701

Dickinson, Robert
885 West 740 South
Richfield, Utah 84701

Clarice Dixon
179 East 575 North
Cedar City, UT 84720

George Douglas
380 Callao Star Route
Wendover, UT 84083

Draper, Mitch
P. O. Box 205
Fremont, UT 84742

Dumas, Brian
PO Box 52
Redmond, Utah 84652

Clifford Duncan
P. O. Box 1892
Roosevelt, UT 84066

J. K. Eardley
P. O. Box 554
Emery, UT 84522

Josiah K. Eardley
2433 South Highway 10
Price, UT 84501

Edwards, David C.
PO Box 52
Mayfield, UT 84643

Edwards, Shaun
220 East Center Street
Centerfield, UT 84622

Edwards, James
381 South 100 West
Price, UT 84501

Ekker, Audie
PO Box 141
Richfield, UT 84701

Ellner, Clint C.
485 South 100 East Lot 40
Wellington, Utah 84542

Elmer, Randy
20 East 300 South
Redmond, UT 84652

England, Kyle
Castle Valley Ranch
Emery, UT 84522

Erickson, Kay
Glendwood, UT 84730

Erickson, Paul H.
42 South 100 East
Salina, UT 84654

Ervine, Donald R.
10 South 565 West
Fillmore, UT 84631

Fairbanks, Brent
PO Box 323
Orangeville, UT 84537

Farrer, Lanpher
Shoshone Tribal Member
PO Box 46
Orangeville, UT 84537

Farrington, Ray
200 North 200 East
Redmond, UT 84652

Felice, Richard
1910 West 4000 North
Helper, UT 84526

Felice, Gary
836 North Pinewood Circle
Price, UT 84501

Fielding, Shay
440 North 200 East
Richfield, Utah 84701

Foatz, Glade
PO Box 41
Mayfield, UT 84643

Folger, Helen
10512 Samaga Drive
Oakton, VA 22124

France, JR
180 South State
Joseph, Utah 84739

Fredrickson, Brian
136 North 200 East Box 49
Gunnison, Utah 84634

H. Paul Friesema, Professor
Institute for Policy Research
Northwestern University
2040 Sheridan Road
Evanston, IL 60208-4100

Peter Galvin
SW Ctr for Biological Diversity
P.O. Box 710
Tucson, AZ 85702

Milo Garcia
560 W. 400 N.
Richfield, UT 84701

Shawn Giacoletto
Joy Mining Machinery
P.O. Box 56
Wellington, UT

James Gilson
Richwood Industries
P.O. Box 787
Castle Dale, UT 84513

Gerald Gordon, President
Utah Wildlife Federation
PO Box 526367
Salt Lake City, UT 84152

Grace, Ned J.
PO Box 579
Levan, UT 84639

Grako, John
Joy Mining Machinery
1275 Ridge Road
Wellington, Utah 84542

Gramse, Harold Kim
190 West 200 South
Richfield, Utah 84701

Gramse, Leslie
290 West 100 South
Richfield, Utah 84701

Gregerson, Larry
PO Box 220086
Centerfield, Utah 84622

Ben Grimes
Hanson, Allen & Luce, Inc.
P. O. Box 777
Price, UT 84501

Wayne & Carrie Lou Gremel
Castle Valley Ranch
Emery, UT 84522

Griffith, Brandon
440 South 200 West
Richfield, UT 84701

Grundy, Steven
P.O. Box 13
Aurora, UT 84620

Guymon, Adam
PO Box 511
Huntington, Utah 84528

Newell Hales
385 Honey
Salina, UT 84654

Tammy Hales
385 Honey
Salina, UT 84654

Hall, Scott
274 East 200 South
Salina, Utah 84654

Hall, Rodney
90 West 100 North
Aurora, Utah 84620

Hallows, Bronson
355 South 300 East
Salina, Utah 84654

Hallows, Cameron
269 South 500 West
Annabella, Utah 84711

Hammel, Carolee
88 West 500 South
Wellsville, Utah 84339

Hansen, Stephen L.
P.O. Box 220053
91 South Darry Road
Centerfield, UT 84622

Hansen, Jimmy L.
PO Box 243
Redmond, Utah 84652

Hansen, Greg W.
99 West 100 South
Central Valley, UT 84754

Hansen, Mark A.
375 South 400 West
Richfield, Utah 84701

Hansen, Lynn
72 South 400 West
Manti, Utah 84642

Harper, Russell
1954 West Haycock Lane
Spring Glen, UT 84526

Harper, John W.
63 North 200 West
Manti, UT 84642

Harper, Tim L.
Tram Electric, Inc.
PO Box 1626
Price, Utah 84501

Harrison, Harold
140 Sunny Brook
Salina, Utah 84654

Harrison, Paul
P. O. Box 1033
Gunnison, UT 84634

Harvey, Travis
1070 North State Street
Sigurd, Utah 84657

Harvey, Terry
400North 300 West
Sigurd, UT 84657

Harward, Douglas C.
2250 West 2050 South
Salina, Utah 84654

Tom Hatch, Senator
P. O. Box 391
Panguitch, UT 84759

Hatch, Mary Ann
PO Box 188
Aurora, Utah 84620

Healey, Rusty
285 North 600 West
Richfield, UT 84701

Heaps, Shannon
1035 West 600 South
Richfield, Utah 84701

Heaps, Jebb
210 South 200 West
Centerfield, Utah 84622

Heath, Joe
PO Box 90
Axtell, Utah 84621

Henrie, Than
510 East 400 North
Richfield, UT 84701

Hess, Lucinda P.
210 North 100 East
Ivins, UT 84738

Hill, David
PO Box 220156
Centerfield, Utah 84622

David Hinkins
P.O. Box 340
Orangeville, UT 84537

Holeman, Dave
412 North 700 East
Payto, UT 84651

Hone, Trent
540 South 100 West
Salina, Utah 84654

Hooky, Kevin
PO Box 735
Ferron, Utah 84523

Rainer Huck, President
Utah Trail Machine Association
1680 East Atkin Avenue
Salt Lake City, UT 84106

Hunt, Glen D.
PO Box 385
Aurora, Utah 84620

Hunt, Owen B.
55 South 300 East
P.O. Box 265
Castle Dale, UT 84513

Hutchings, Norman R.
1840 North Hwy 118
Monroe, Utah 84754

Hutchings, Dillan
145 West 600 South
Richfield, Utah 84701

Jalt, Clay C.
400 North 455 West
Richfield, UT 84701

Jamison, Don
155 East 100 South
Venice, Utah 84701-9392

Jaramillo, Jerry
155 Carson
East Carbon, UT 84520

Jeater, Cash
180 South 200 West
Salina, Utah 84654

Jeater, Fred
411 South 100 East
Salina, Utah 84654

Tracy Jeffs
Box 818
Castle Dale, UT 84513
Fred S. Jenkins
880 North 200 East
Price, UT 84501

Jensen Family Trust
P. O. Box 574
Emery, UT 84522

Lloyd and Reta Jensen
P. O. Box 42
Emery, UT 84522

Jensen, Steven J.
601 North Duckspring Road
Moroni, UT 84646

Jensen, Mark C.
PO Box 473
Ferron, UT 84523

Jensen, Michael
PO Box 2200254
Centerfield, Utah 84622

Jensen, Royal Reed
154 North 400 East
Richfield, Utah 84701

Jensen, Scott
Gary Shoes
126 North Main Street
Richfield, Utah 84701

Jensen, Delbert E. & Sharon
P. O. Box 82
Emery, UT 84522

Jensen, Jarred
760 West 1000 South
Richfield, Utah 84701

Jensen, Troy
PO Box 514
Huntington , Utah 84528

Jewkes, Boyd
P.O. Box 73
Aurora, UT 84620

Jewkes, Michael
P.O. Box 216
Orangeville, UT 84537

Ronnie Jewkes
Tram Electric
327 N. 200 E.
Price, UT 84501

Craig Johansen
Emery County
Emery, UT 84522

John, Jeff B.
P.O. Box 43
186 East 350 North
Aurora, UT 84620

Johns, David
150 North 100 East
Monroe, UT 84754

Johnson, Frank
Castle Valley Ranch
Emery, UT 84523

Johnson, Jared
301 Doffy Drive
Salina, Utah 84654

Johnson, Gordon S.
234 West 400 North
Salina, Utah 84654

Johnson, Rick
3035 North 2000 West
Delta, UT 84624

Glendon E. Johnson
1200 Oakhills Way
Salt Lake City, UT 84108

Jones, John S.
360 West 300 South
Richfield, Utah 84701

Jorgenson, Dave
180 North 100 West
Salina, Utah 84654

Ramal D. Jones
P.O. Box 813
Castle Dale, UT 84513

Juab County Commission
160 North Main Street
Nephi, UT 84648

Kailey, Michael J. Jr.
P.O. Box 570112
825 North State
Sigurd, UT 84657

Bonnie P. and Don W. Keele
P.O. Box 217
Ferron, UT 84523

John Keeler
Utah Farm Bureau Federation
406 East Union Street
Manti, UT 84642

Kemmerer Coal Company
Frontier, WY 83121

Kennedy, Boyde
390 North 400 West
Aurora, Utah 84620

James O. Kennon
P.O. Box 440067
Koosharem, UT 84744

Kesler, Gale
P.O. Box 300555
Glenwood, UT 84730

Kay Kimball, President
Sevier Wildlife Federation
P. O. Box 663
Richfield, UT 84701

Ms. Martha Kingston
Pacificorp DBA Utah Power
1407 W. North Temple, Ste 110
Salt Lake City, UT 84140

Kirkman, Kirk
75 West 100 South
Nephi, Utah 84648

Kit, Shane
P.O. Box 447
Aurora, UT 84620

Kofford, Will
P. O. Box 1293
Huntington, UT 84528

Kouns, Jeff
PO Box 151
Mona, Utah 84645

Larsen, Thayne
377 South 100 East
Richfield, UT 84701

Larsen, Greg R.
275 South 100 East
P.O. Box 114
Bicknell, UT 84715

Lawson, Brent C.
475 East 2nd North
Annabella, Utah 84711

Leamming, Gary
80 North Center Street
Redmond, Utah 84652

Leavitt, Evan
930 East 400 North
Fremont, Utah 84747

Leavitt, Jeff
425 East 520 South
Monroe, Utah 84754

LeNay, Elles
243 East 100 South
Salina, UT 84654

Lenth, Eric
P.O. Box 10
Monroe, UT 84754

Lewis, Marty
99 North 500 West
Aurora, Utah 84620

Lewis, Glen A.
PO Box 235
Aurora, Utah 84620

Lois, Glen K.
180 East 200 North
Monroe, UT 84754-4202

Long, Matt
210 North Salina Creek Drive
Salina, UT 84654

Lopshire, Jerry
355 North Honey Drive
Salina, UT 84654

Bert Lowry
1890 N. Lowry Lane
Richfield, UT 84701

Lund, Ronnie
P.O. Box 462
Aurora, UT 84620

Malmgren, Scott
340 East 100 South
Salina, Utah 84654

Malmgren, Dustin
300 North 150 East # 2
Salina, Utah 84654

Malmgren, Jody K.
PO Box 635
Gunnison, Utah 84634

Barbara J. Mangan
Public Land Use Consultant
11400 Kona Ranch Road
Missoula, MT 59801

Mangun, J. D.
P. O. Box 633
Emery, UT 84522

Manning, Steven J.
Utah Archaeological Research Institute
791 Nancy Way
North Salt Lake, Utah 84054

Marsh, Justin
PO Box 84
Redmond, Utah 84652

Martines, Anthony
Tram Electric, Inc.
PO Box 1626
Price, Utah 84501

Mason, Royce A
PO Box 392
Aurora, Utah 84620-0392

Mason, Jerry
705 West 400 North
Salina, UT 84654

Mason, Russell
10 South 200 East
Aurora, Utah 84620

Mason, Brandon J.
P.O. Box 185
Aurora, UT 84620

Tim McCallum
Susan Bell
Long-Airdox Co.
Box 1190
Huntington, UT 84528

Sandy Phillips
Editor, Richfield Reaper
65 West Center Street
Richfield, UT 84701

McCoard, Fred
PO Box 277
Redmond, Utah 84652

McEown, Kenny
320 South 500 West
Aurora, UT 84654

McEwen, J. Rick
475 West 600 South
Richfield, Utah 84701

McKendrick, Robert L.
Tram Electric, Inc.
PO Box 1626
Price, Utah 84501

Meacham, Kyle
908 West 800 South
Richfield, UT 84701

Mecham, A. Quay
22 North 200 East
Axtell, UT 84621

Mellur, Brent
265 East 50 North
Fayette, Utah 84630

Mickelson, Richard
60 North 300 East
Salina Utah 84654

Mickleson, Joe
288 East 200 South
Salina, Utah 84654

Mickleson, Kade
540 West 800 South
Richfield, UT 84701

Millard County Commission
50 South Main Street
Fillmore, UT 84631

Lane Miller
956 Wadleigh Lane
Price, UT 84501

Miller, Mark E
PO Box 414
Gunnison, Utah 84634

Miller, Ellis
PO Box 73
Scipio, Utah 84656

Minor, Jay C.
270 West Center Street
Sigurd, Utah 84657

Mayor of Monroe
10 North Main Street
Monroe, UT 84754

Kary Monroe
Jones & DeMille Engineering
1440 S. Pipeline
Richfield, UT 84701

Moretti, Julie A.
CSI
PO Box 911
Price, Utah 84501

Mortensen, Mark T.
305 North 400 West #2
Salina, Utah 84654

Mortensen, Cardell
Tram Electric, Inc.
PO Box 1626
Price, Utah 84501

Cecil H. Muir
P.O. Box 766
Milford, UT 84751

Munk, Shawn
PO Box 220301
Centerfield, UT 84622

Nash, Malcolm
Sevier County Economic
Development
250 North Main St.
Richfield, UT 84701

Nebeker, Jerry
90 South 100 West
Annabella, Utah 84711

Neffsinger, Lester
392 West 100 North
Richfield, Utah84701

Neilson, Rodney
470 North Main Box 4
Aurora, Utah 84620

Nelson, Jess
405 West Mill Road
Ferron, Utah 84523

Nelson, S.
275 South 100 East
Salina, UT 84654

Nielsen, Gary
440 West 40 South
Marysvale, Utah 84750

Nielson, Wilford L.
P.O. Box 484
207 South 300 West
Huntington, UT 84528

Nielson, Steven K.
815 South 400 West
Richfield, Utah 84701

Mayor Evelyn Nielsen
P.O. Box 69
Salina, UT 84654

North Emery Water Users
Stoyanoff, Jack
P. O. Box 129
Cleveland, UT 84518

Nowers, Carson
2805 S. Cove View Road
Richfield, UT 84701

Noyes, Jeff
PO Box 533
Ferron, Utah 84523

Noyse, Kristoffer G.
146 East Main
Salina, Utah 84654

Oldroyd, Gordon
PO Box 141
Annabella, Utah 84711

Earl Olsen
123 2nd Avenue, Apt. 1101
Salt Lake City, UT 84103-4720

Olsen, Jon D.
PO Box 220098
Centerfield, Utah 84622

Christine Osborne
Public Lands Resource
Specialist
2537 Lynwood Drive
Salt Lake City, UT 84109-1606

Otis, Roger
848 West 800 South
Richfield, UT 84701

Otten, Travis
Box 650004
Sterling, UT 84665-0004

Otto, Steve M.
785 North 500 West
Manti, UT 84642

Overall, Delmar T.
PO Box 15
Escalante, Utah 84726

Owens, Shirece C.
535 South Aspen Circle
Salina, Utah 84654

Douglas Pace
Emery Telephone
P.O. Box 3
Ferron, UT 84523

Bill Partner, President
Utah Council Trout Unlimited
906 West Brander Mill Cove
Murray, UT, 84123

Patterson, Dennis
923 South 780 West
Payson, Utah 84651

Pay, Billy A
195 North 100 East
Centerfield, Utah 84622

Payne, Craig
210 South 200 West
Centerfield, Utah 84622

Pedersen, Glen
58 North 500 East
Richfield, UT 84701

Pendleton, Michael
767 West 1050 South
Richfield, Utah84701

Salina City
90 W. Main
Salina, UT 84654
Jeffrey D. Perkins
1481 North 750 East
Kaysville, UT 84037

Kent Petersen
Emery County Commission
P. O. Box 629
Castle Dale, UT 84513

Peterson, Alan
SEUOHV
PO Box 382
Castledale, Utah 84513

Peterson, Jason
175 North 400 West
Salina, Utah 84654

Kent Peterson
P.O. Box 935
Ferron, UT 84523

Peterson, Riley
510 North Woodhill Drive
Price, UT 84501

Gary Petty
P. O. Box 44
Emery, UT 84522

Phillips, Richard
PO Box 106
Annabella, Utah 84711

Ron Piccolo
Pacific Central Steel
P.O. Box 729
Price, UT 84501

Richard Pick
Canyon Fuel Company, LLC
6955 Union Park Center, Ste 540
Midvale, UT 84047

Piep, Cory
PO Box 236
Redmond, Utah 84652

Ellis Pierce
P.O. Box 792
Price, UT 84501

Rick and Rena Pikyavit
715 South 960 West
Richfield, UT 84701

Poulson, Dan and Debi
893 West 570 South
Richfield, UT 84701

Price, Ray
P.O. Box 33
Kanosh, Utah 84637

Prince, William
Dorsey & Whitney, L.L.P.
170 S Main Street, Suite 925
Salt Lake City, UT 84101

Quarnberg, Jan
435 North Main
P.O. Box 125
Annabella, UT 84711

S. J. & Jessier E. Quinney
Natural Resource Research Library
Carla G. Heister, Director
5260 Utah State University
Logan, UT 84322-5260

Quitchupah Cattle & Horse Association
P. O. Box 65
Emery, UT 84522

Randles, James A.
558 South 300 West
Richfield, Utah 84701

Rasmussen, Andy
PO Box 293
Aurora, Utah 84620

Rasmussen, Bert
95 East 200 South
Centerfield, Utah 84622

Rassmusen, Steven
260 North 200 East
Salina, Utah84654

David Richerson
2322 Hillshire Drive
Deer Park, TX 77536-5862

Mayor of Richfield
P. O. Box 250
Richfield, UT 84701

Richfield Library
83 East Center Street
Richfield, UT 84701

Rickenback, Ryan
730 West 800 South
Richfield, UT 84701

Robb, K. R.
Tram Electric, Inc.
PO Box 1626
Price, Utah 84501

Roberts, Chuck
PO Box 94
Salina, Utah 84654

Roberts, Jana
PO Box 222
Redmond, Utah 84652

Roberts, Dave
349 East 100 North
Salina, Utah 84654

Roberts, Jeremy M.
940 North State
Sigurd, Utah 84657

Morgan Robertson
Quitchupah Grazers Association
P. O. Box 65
Emery, UT 84522

Allen Robins
60 Sunnybrook Dr.
Salina, UT 84654

Robins, Jack B.
490 Sunny Brook Drive
Salina, Utah 84654

Art Robinson
95 North 200 East
Salina, UT 84654

Robinson, Brock
580 West 400 North
Richfield, UT 84701

Kim Robinson
635 West 400 North
Salina, UT 84654

Robinson, Louis
130 North White Drive
Salina, UT 84654

Robinson, Kim (President)
Robinson Transport Inc.
850 West Main
Salina, Utah 84654

Rosquist, Fred L.
515 South State
Redmond, Utah 84652

Marilyn S. Anderson
Mayor of Salina
P.O. Box 69
Salina, UT 84654

Sanders, Lorin
Barclay Mechanical Services, Inc.
595 West 100 North
Manti, Utah 84642

Savage, Neil
Savage Industries
5250 S. Commerce Dr., Ste 200
Salt Lake City, UT 84107

Savage, Ryan
P.O. Box 892
Richfield, UT 84701

Shaw, Brett
380 South 200 West
Salina, UT 84654

Shiner, Kent D.
Longwall West, Inc.
PO Box 973
Price, Utah 84501

Siekman, Jud
RM Wilson Company
PO Box 973
Price, Utah 84501

Greg Schaefer
Arch Coal, Inc.
P.O. Box 406
Wright, WY 82732

John Sihestedt
P. O. Box 1778
Emery, UT 84522

Simkins, Douglas J.
Western Mine Tools
PO Box 756
Price, Utah 84501

Sam Singleton
Emery Historical Society
370 South State
Ferron, UT 84523

Glenys Sitterud
Emery City Councilperson
Box 523
Emery, UT 84523

Sitterud, Lannie
82 West 200 South
Emery, UT 84522

Smith, Steve
279 North Honey Drive
Salina, UT 84654

Smith, Richard M.
PO Box 220192
Centerfield, Utah 84622

Snow, Tim
628 Builion
Marysvale, UT 84750

Smith, Steve
279 North Honey Drive
Salina, UT 84654

Smith, Richard M.
PO Box 220192
Centerfield, Utah 84622

Snow, Tim
628 Builion
Marysvale, UT 84750

Wes Sorensen
SUFCO Mine
P.O. Box 193
Salina, UT 84654

Southern Utah Forest Products Association
P. O. Box 101
Bicknell, UT 84715

Southern Utah Wilderness Alliance
1471 South 100 East
Salt Lake City, UT 84105

Morris and Ronnie Sorensen
P. O. Box 104
Emery, UT 84522

Wayne Sorensen
P. O. Box 41
Gunnison, UT 84634

Spencer, Shon
P.O. Box 220078
Centerfield, UT 84622

St. Prince, Fred
35 North 200 West
Redmond, UT 84652

Wayne E. & Delise R. Staley
P. O. Box 83
Emery, UT 84522

Stapel, Mark M.
235 South Sunny Brook Drive
Salina, Utah 84654

Steven Steed
Utah Forest Products
P. O. Box 379
Escalante, UT 84726

Joseph Stephenson
2177 Shadybrook Lane
Birmingham, AL 35226

Randy Stockdale
401 Arbor Drive
Carterville, IL 62918

Jack Stoyanoff
North Emery Water Users
P. O. Box 129
Cleveland, UT 84518

Michael Styler
Representative
1755 West 5500 South
Delta, UT 84624

David Sucec
832 Sego Ave.
Salt Lake City, UT 84702

Sudweeks, Dustin
85 West 100 North
Aurora, UT 84620

Sullivan, Patrick
673 West 1000 South
Richfield, Utah 84701

Summarell, Reese
50 West 200 South
Salina, UT 84654

Sundstrom, Jon H.
Emery Town Council
PO Box 562
Emery, Utah 84522

Lee & Margaret Swasey
P.O. Box 308
Ferron, UT 84523

Mont & Joanna Swasey
P.O. Box 1064
Castle Dale, UT 84513
Tamllos, S.J.
P.O. Box 1505
Price, UT 84501

Tatum, Steve
210 E. 100 North
Aurora, Utah 84620

Taylor, Jonathan
165 North Main
Central, Utah 84754

Theigpen, Kevin
600 West 600 South, #29
Richfield, UT 84701

Tobler, Ryan
297 North 500 East
Annabella, Utah 84711

Torgerson, Ronnie J.
105 South State
Salina, Utah 84654

Greg Fredde, President
Utah Mining Association
136 South Main, #709
Salt Lake City, UT 84101-1672

Udy, Joseph
PO Box 420
Aurora, Utah 84620

Quentin E. Utley
105 Clear Creek Drive
Sandy, UT 84070

Vanderherp, Louis
P. O. Box 242
Ferron, UT 84523

Herman Viau
Lakeshore Mining
90 East 1300 South
Price, UT 84501

Vipperman, Gary
P. O. Box 341
Orangeville, UT 84537

Vlamaicis, Stephen G.
4345 North 200 West
Helper, Utah 84526